DOCUMENT RESUME

ED 118 497 SO 008 898

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TITLE Life World 2000: A Guide for Teachers.
INSTITUTION Agency for Instructional Television, Bloomington, Ind.; KETC-TV, St. Louis, Mo.
SPONS AGENCY Surnen Foundation, St. Louis, Mo.
PUB DATE 74
NOTE 73p.
AVAILABLE FROM Agency for Instructional Television, Box A, Bloomington, Indiana 47401 (prepayment required, $2.00, 10-499 copies $1.35, 500 or more copies $1.40)

EDRS PRICE MF-$0.83 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS Decision Making; Demography; Educational Television; Environmental Education; Futures (of Society); Global Approach; Learning Activities; *Population Distribution; *Population Education; Population Trends; Secondary Education; Social Studies; Teaching Guides; Teaching Techniques; *Television Curriculum; Values; World Problems

ABSTRACT

This teaching guide on population education is designed to accompany a television series by the same title. The series of twelve 15-minute color programs provides the basis for a high school course in population education. Produced under a foundation grant, the series is available from National Instructional Television, a division of the Agency for Instructional Television. The series considers a wide range of population-related issues in the United States, helping students to understand how their actions have an impact on population and how population has an impact on them as individuals. Students develop effective criteria for decision making, examine their own values about population matters, and become aware of the consequences of their actions on themselves, their family. their society, and the world. Each unit in the instructor's guide corresponds to a specific program and includes the purpose, program content, suggested activities, teacher facts and figures, and student materials to be duplicated. Charts, graphs, and a bibliography conclude the document. (Author/JR)

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LIFE WORLD 2000

A Guide for Teachers

This guide was written by William F. Bailey under the editorial supervision of Stephen Viederman, Michael S. Teitelbaum, and Andrew J. Leighton.

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A series of twelve 15-minute color programs in population education for junior and senior high school students. Produced by KETC-TV, St. Louis, under a grant from the Sunnen Foundation. Available from National Instructional Television, a division of the Agency for Instructional Television.

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"Life World 2000" was produced through a grant from The Sunnen Foundation, St. Louis, Missouri.

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LIFE WORLD 2000: A Guide for Teachers

ERRATA

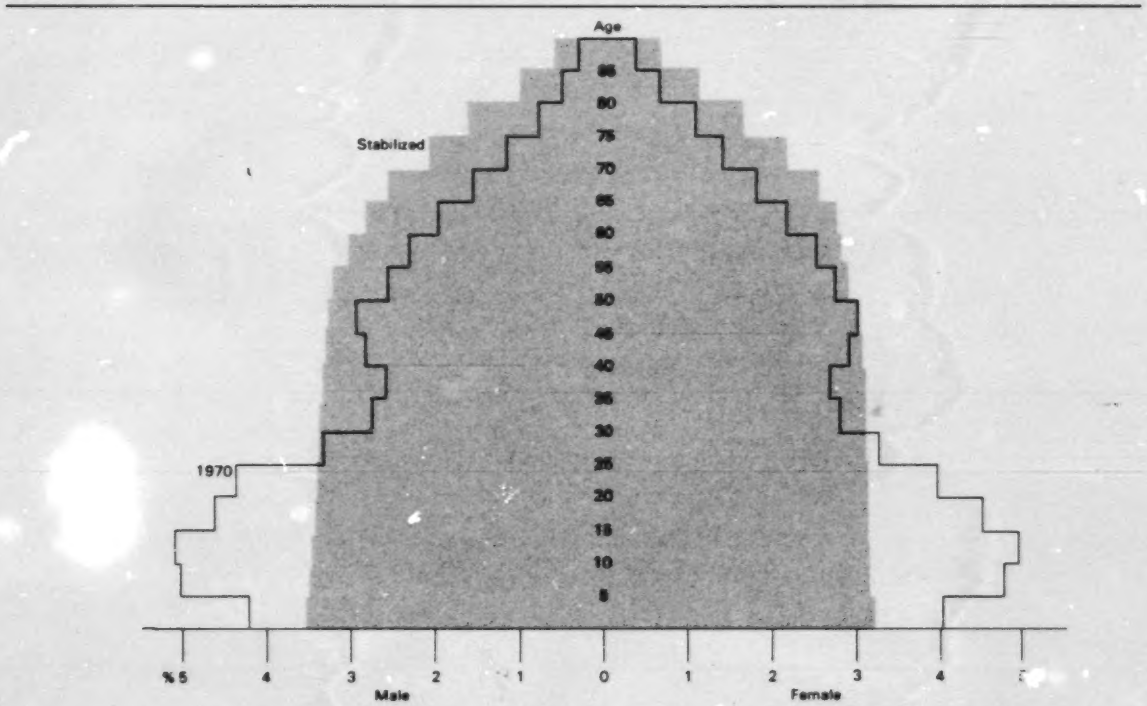
Page VI, column 1. Line 7 under Program Content should begin: "This is particularly important . . . ."

Pages 2 and 3. Bullet paragraph in column 1 of page 3 beginning "The Population Knowledge Inventory" should follow paragraph 1, column 2, page 2, ending ". . . in their own words" and immediately precede the article "I AM A . . . POPULATION ACTOR?"

Page 17, column 1. Line 1 of paragraph 1 under "WHAT STUDENTS WILL SEE AND LEARN" should begin: "Adam and Eve introduce . . . ."

Page 57, Figure 7.1, Age Distribution chart should have grey overlay, as below:

Age Distribution



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Notes on Population Education*

by Stephen Viederman**

Population problems are clearly on the agenda for many nations, and the next few years will undoubtedly see much public discussion and policy formulation. President Nixon indicated U.S. concern by his appointment in 1969 of a Commission on Population Growth and the American Future, specifically mandated to make recommendations for official policy. That Commission reported in mid-1972, with much publicity. Other countries have already set, or are in the process of setting, their own population policies.

Here is a controversial area, with strong partisans for various viewpoints, in which policy has to be set —policy that will require citizen understanding, support, and participation. This is a compelling reason for it to be studied in our schools, where the subject matter can be dealt with objectively, not as propaganda. Developing education programs that deal with social issues is a characteristic procedure for enhancing public understanding, and population should be no exception.

Taught in the schools as a phenomenon to be understood, not as a problem to be solved, population education need not be more sensitive than other areas. And since an understanding of the consequences of population changes is directly relevant to the students' own lives, it has an immediacy and interest rare in much of the curriculum.

Some recent studies indicate that students are concerned about population, but are not very knowledgeable. A 1971 survey of 1,600 high school students in urban and suburban New York and New Jersey revealed that 29% thought that U.S. population was less than 10 million, while another 15% thought in terms of 500 million . . . . While some 25% knew the true world population (approximately 3.6 in 1970), another 25% thought it exceeded 50 billion. Another study at Indiana University concluded that students do not know facts, trends, or relationships in population matters, most particularly not as causes or results of, nor as contributors to, other social problems.

Population education involves more than learning the size of different populations, although ideally it does include some elementary knowledge of the arithmetics of population growth. It should incorporate into the curriculum concepts and materials that deal with population processes and characteristics, causes of change, and, most important, the consequences of such changes for the individual and the society. Population education should additionally be concerned about the effective means by which an individual, and his society, can deal constructively with the consequences of population change.

Further, while population education is neither family planning or family life education, nor sex education or environmental education, the student does learn that the cumulation of individual acts has social, biological, and environmental effects on himself, his family, his society and the world at large. Such understanding can help provide the student with the knowledge, skills, and sensitivities needed for rational and responsible decisions concerning his own future, both as an individual and as a member of his society. This is truly education for citizenship.

Much more research is needed before fully fleshed-out programs can be presented, and we need to pay particular attention to developing the knowledge base which must underlie education programs. For example, we know little about the relationship of family size to family well-being; or precisely how population size and distribution affects an individual and his family; or when people begin to think in terms of their own desired or ideal family size; or how values and attitudes toward population matters are formed; or the true depth of feeling about childbearing, family size, and women's roles. Would a person living in a rural area which has experienced sizable out-migration have substantially different perceptions of the problems arising from population change than someone coming from an urban area being crowded by immigration? While these and sundry other matters need research and hard data, there is still enough substantive information at hand to begin the introduction of population education into the classroom.

Such education can focus on the relation between population and the quality of life, and between population and the development of public policy. It can deal with both the cognitive and affective, going beyond knowledge and skills to the exploration of values and attitudes. The student can do research in his own community, which has cultural and educational traditions that he is familiar with and which are important to him. And we can direct his attention to the interdisciplinary content and the global connotations of popular problems . . . .

. . . Data collected by the Commission on Population Growth and the American Future indicate that 80% of a national sample of people over sixteen believed that schools should give special attention to the causes and consequences of population growth in the United States and the world. This is the natural place to begin acquainting future citizens with the problems with which they will have to deal as they assume responsibility for our society . . .

*Excerpted from an article in *Intercom* 72.

**Assistant Director of the Demographic Division of The Population Council. He was editor of the special issue of *Social Education* on population education (April 1972). He also wrote the population education section of the report of the President's Commission on Population Growth and the American Future. He has served as chief consultant to KETC-TV in the research and production of "Life World 2000."

TO THE TEACHER

"Life World 2000" is the first American instructional television series on population produced specifically for use in the classroom. The twelve programs, taken together, provide an introductory course for the study of population. The series considers a wide range of population-related issues, and provides ample room for a broadening of these issues or the addition of concerns that may be more appropriate to your situation.

The series focuses on the United States and subscribes to three basic objectives:

1. To help students understand how their actions have an impact on population.
2. To help students understand how population has an impact on them as individuals.
3. To help students develop effective criteria for decision-making.

The programs are open-ended and strive for objectivity. Students are encouraged to examine their own values about population matters and to be aware of the consequences of their actions on themselves, their family, their society, and the world. They are encouraged to probe more deeply into matters, to examine issues cautiously and critically, to dissent when they feel it is necessary, and above all to question the validity of any and all statements.

Far too often we hear cries of "overpopulation," and "overbreeding." For the most part, these are crisis words that have no inherent meaning. "Life World 2000" avoids a crisis approach. We urge you to do likewise. You and your students will discover that the series frequently uses the term "population change" rather than "population growth." It does so for good reason. Change includes population decline as well as growth, distribution and migration as well as size. Language is of utmost importance when speaking of population.

By introducing your students to the population actor concept, you, as teacher, will be helping them to see the role each plays in deciding the future of America and the world.

The Teacher's Role

Your part, as teacher, is most important. You establish the climate to evoke student responses. The TV program serves only as a primer, a stimulus to further in-depth probing. To utilize this series effectively, you should encourage the meaningful exchange of ideas among your students. Personalize the issues to assist students in understanding the broader implications and how they as individuals fit into the processes of population change. Because the study of population is the study of people, we think that you and your students will find the series interesting, exciting, and rewarding.

For many of you, the study of population will be a new experience. You will be using a population curriculum for the first time. In all probability, however, you have been teaching population-related issues all along, without thinking of them as population issues. The use of land and natural resources, the plight of our central cities, economic and social discrimination, the environment and pollution, energy and food consumption—all are population related. Perhaps the most extraordinary aspect of population education is its applicability to existing curriculums: social studies, contemporary problems, science, and biology. It touches many other seemingly unrelated subjects—English (think of the creative stories that can be written) and mathematics (yes, we have formulas, too).

In any event, we direct your attention to the bibliography on page 52 of this guide. The books offered provide a knowledgable introduction to population issues, processes, and change.

How To Use This Guide

This guide is structured to help you use "Life World 2000" effectively in the classroom. Each unit corresponds to a specific program and is essentially broken into four parts:

1. Purpose
2. Program Content (What Students Will See and Learn)
3. Suggested Activities
4. Teacher Facts and Figures and Student Materials to be Duplicated.

Purpose

This is a one-sentence description of the key idea or learning point of the program.

Program Content

Each unit contains a brief scene description followed by the key learning points for that particular segment. Scenes and content are sequential, as they appear in the program. The description of key scenes should refresh the student's memory about the manner in which the material was presented. This particularly important if you are teaching the lesson a day other than that of the telecast.

For the most part, content provides only the basics, but should be sufficient for effective teaching. If more detail is required, we suggest using the books listed in the bibliography.

Suggested Classroom Activities

The activities offered in this guide are only suggestions. You and your students may find more creative and meaningful exercises.

Activities are divided into two groups: Before the Program and After the Program. Many activities are overlapping and may be used with other programs. For example, Activity 8 (Program 4) on page 19 could also be used in Programs 9 and 11.

It is important to reinforce values whenever possible and appropriate. The activities section for Program 1 includes several exercises dealing with values. If any activity is to be considered on-going, it is this one. Values play a role in virtually all population-related processes and are absolutely fundamental in the development of population policies.

The vocabulary exercises, though listed as a "Before" activity, may be used at your discretion. It is advisable, however, to introduce the vocabulary prior to the broadcast to aid students' comprehension of the program.

Teacher Facts and Figures and Student Materials To Be Duplicated

Teacher facts and Figures generally consist of statistics from the 1970 U.S. Census of Population.

The Population Values Inventory or the "I Am A Population Actor" narratives are examples of Student Materials To Be Duplicated. Instructions for use are found in the activities section or are printed on the actual materials. Students should retain these materials for future reference.

PROGRAM 1

Overview

PURPOSE: ***To show students why the study of population is important.***

BEFORE THE PROGRAM:

This introductory program previews several concepts covered in greater detail in later programs. Students may not retain much of the factual material presented, nor is the program designed for them to do so. This material has been included solely to suggest the wide range of population-related issues and to arouse interest in the programs to follow. Rather than concentrating on the "hard" demographic data, we urge teachers to direct student efforts toward greater understanding of two key components:

- The importance of values in human behavior and decision making.
- The concept of people as population actors.

We have provided a number of exercises in the post-telecast activities for this program that should aid you. Consider the activities recommended to accompany the Overview program applicable to the entire series.

WHAT STUDENTS WILL SEE AND LEARN:

- *An inventor and a delivery boy talk about population and see excerpts from the programs to follow.*

  The study of population is more than the study of numbers. It is the study of people; and we, as population actors, should begin to see ourselves as part of the population, not just onlookers. We should realize the consequences of our actions, inactions, and decisions on ourselves, our family, our society, and our world.

- *Demographic concepts which are introduced during the program:*
  1. The earth is finite.
  2. Populations grow geometrically.
  3. We do not know the optimum or maximum levels of population for the earth.
  4. The word "overpopulation" has no inherent meaning. Each of us, depending on our values, will probably define the word differently.
  5. Population is growing principally because the death rate has declined faster than the birth rate.
  6. Different size families have served different needs in different periods of history.
  7. An average of about two children per woman is called *replacement level fertility*. It is the fertility level necessary to ultimately achieve a zero rate of population growth.
  8. Population stabilization—when the population stops growing—is not the solution to all the problems we face. However, it might provide us with opportunities to seek solutions to problems, such as pollution, instead of just trying to supply a growing population with the goods and services it needs or desires.
  9. Speculation about the future is difficult.
  10. Predictions are risky because they rely on assumptions about future trends that we cannot make accurately.

SUGGESTED ACTIVITIES:

Before the Program

1. Elicit student definitions for "value," "issue," and "problems.
2. Have students complete the Population Values Inventory on page 4.
3. Have students complete the Population Knowledge Inventory on page 5.
4. Have students complete the vocabulary exercise on page 3.
5. Have students write a creative story about life in the year 2000.
   What characteristics do they see?

After the Program

- As a class, analyze the Population Values Inventory. Have students tabulate the results to determine if there are any class trends. Some things to look for:
  1. Values toward marriage and nonmarriage, family size, family roles, and childbearing. Do most students subscribe to traditional beliefs? Are there biases toward nonmarriage? Does fulfillment in a marriage always involve children? Expected family size? Atti-

tudes toward the emerging role of women. Compare responses between males and females.

2. Opinions regarding male and female roles in society. Women as wives and mothers; men as breadwinners? Attitudes toward women's liberation. Does it threaten the male image?
3. Population as the sole contributor to the world's problems. Is it numbers only? Do students see other possible causes?
4. Population as crisis. Do students regard the world as being "overpopulated"? Why? Is population of concern? Does the U.S. have a "population problem"? Why or why not? Does India?
5. The prevalence or absence of the "growth is progress, progress is growth" ethic. Is new construction symbolic of a healthy economy? Do more people and more jobs mean a healthy country? Are there concerns about land use, consumption, and distribution?
6. Personal values, particularly where and how to live. Values for the "good life." What is the "good life"?
7. The role of the United States in world population concerns. Isolationism or involvement? Why or why not?
8. The role of the government in American population concerns. Force or free choice? Why or why not?
9. Values toward survival, human dignity, and individual worth. Survival for what? For whom? What is human dignity and self worth? Selfishness or cooperation among individuals?

- Reproduce the Population Values Inventory and have students broaden the survey.
  1. Interview other students in the school.
  2. Interview three generations of people to compare values. What might account for this? Start with grandparents, parents, brothers and sisters, or friends.
  3. Interview people from several walks of life for a broader idea of different values. Some suggestions: e.g. business person, foreign born person, religious leader, person or persons of minority groups, doctor, dentist, lawyer, working woman with nonworking husband, young married couple with no children, and traffic policeman.

- Volunteers should take a position on a set of values and be prepared to defend it before the class. Elicit challenges from other students.

- Reproduce and distribute the article, I AM A . . . POPULATION ACTOR? Have students, after reading the article, write a creative essay entitled "As a Population Actor, What Decisions Do I Make?" Students should consider both immediate and future decisions (conscious and unconscious), and actions or inactions. As reinforcement, you may reproduce the quote from the U.S. Commission on Population Growth. Encourage students to summarize the paragraph in their own words.

I AM A . . . POPULATION ACTOR?

Right. Each of us is a population actor. We may not be aware of it, we may not even intend it; nonetheless, each of us plays a part in the processes of population change. Sometimes we can control the process, sometimes not. Many times, we are not aware of our influence, but it is there.

How then are we population actors? To begin with, each of us is born and all of us will eventually die. That's part of the population process. True, we have no control over our own birth, but from the moment we are born we become a population actor. That's when we become a part of the population. Of course, at this time we aren't making any decisions, and consequently have little to say about population change. We've contributed, certainly—just by being here; but we'll have a greater impact when we grow up and start making decisions.

As individuals we can choose to marry or not, to have children or not, when to have children and how many, to live where we want, to own a home and an automobile, to vacation where we please. All of these actions contribute in some way to the process of population change. Think of it this way. What would happen if you suddenly decided to move to another classroom? Not much, probably. Your new teacher would have another test paper to grade. Perhaps another desk would have to be brought in. Maybe you might crowd someone—just a little. Overall, there probably would be little change. But think what would happen if your *entire* class decided to move into that same classroom? Makes quite a difference, doesn't it?

Of course, there's much more to population change than just adding or subtracting numbers. The United States is a big country, but just because we have a lot of open land doesn't mean we can accommodate more people forever. Physically, that's impossible. Our planet is finite: limited in size, space, and resources. That's why we, as population actors, should be aware of the consequences of our actions and inactions—now and in the future.

How else might we influence population? In owning an automobile, we contribute to problems of congestion and air pollution. If we decide to move to a surburban subdivision, we may live on once fertile farmland, now paved over. If we buy soft drinks in cans, we are adding to the problem of solid waste disposal. When we vote or don't vote, we help to shape political decisions that affect the community, state, and nation.

These are all population-related actions, and just as we have an impact on population, so does population have an impact on us. For instance, the distribution of population will most likely influence our decisions about where to live. Realistically speak-

ing, we will choose an area where there are jobs, housing, and other facilities that provide the necessities and pleasures of life. In the United States today that means moving to or near a metropolitan area. Seven of every ten Americans live in such an area. Who is responsible for this metropolitan growth? Population actors! We move there. We build the houses. We demand the goods and services.

• The Population Knowledge Inventory serves as a pre- and post test measurement of student learning. It should be readministered after students have viewed the final program in the series.

Every day we are participating in the processes of population change. We cannot create or solve the resulting problems alone. We are affected individually, but the problems that arise are the result of collective decisions. By being aware of our group impact we will begin to see ourselves in the role of population actors.

> "There is scarcely a facet of American life that is not involved with the rise and fall of our birth rate and death rate: the economy, environment, education, health, family life and sexual practices, urban and rural life, governmental effectiveness and political freedoms, religious norms and secular life styles. If this country is in a crisis of spirit—environmental deterioration, racial antagonisms, the plight of our cities, the international situation—then population is part of that crisis."
>
> The U.S. Commission on Population and the American Future, 1972, p. 12.

PROGRAM 1

VOCABULARY EXERCISE

Unscramble the population-related words listed below and match them with their correct definition.

PUNTILOOPA	OPTIONLAVRUEPO
NIETIF	BUTTONRIDISI
RECEMENTLAP	CRIPEDIONT
BLSATE	COGMIETER
LIFTERITY	CUPSTALEION
TUPMOMI	POSSUMATIN

A. A forecast of what will happen in the future.
B. A statement taken as granted or true; supposition.
C. The body of inhabitants (e.g. people, rocks, planets, animals) in a given area at a given time.
D. The number of children born to women.
E. Having limitations or boundaries.
F. Conjectural consideration of a matter.
G. The way a population is spread over a given area.
H. The best or most favorable under specific conditions.
I. Assumes that we know an optimum level of population and the earth's carrying capacity and that the actual population is larger than the optimum.
J. The progression of population growth, following the principle of compound interest.
K. A population whose rate of growth or decline is constant, and in which the birth rate, death rate, and age-sex structure are also constant.
L. A fertility level where women have an average of about two children.

KEY	
POPULATION (C)	"OVERPOPULATION" (I)
FINITE (E)	DISTRIBUTION (G)
REPLACEMENT (L)	PREDICTION (A)
STABLE (K)	GEOMETRIC (J)
FERTILITY (D)	SPECULATION (F)
OPTIMUM (H)	ASSUMPTION (B)

POPULATION VALUES INVENTORY

Before the Program Activity 2, page 1.
After the Program Activity 1, page 1.

Values are an integral part of population dynamics and change. They are crucial in the development of population policies. Throughout "Life World 2000," students will be asked to consider their own values regarding a particular situation and how these values apply to themselves, their families, society, and the world. The impossibility of choosing a common single set of values will become clear to students after viewing the program.

Have students complete the following Population Values Inventory. Inform students that the questions ask only for their opinion. There are no right or wrong answers. Read each question, then decide which choice is *best*. Although forty questions are provided here, teachers may use any, all, or class discussion based upon individual time considerations.

Ask students to retain their individual copy of the Population Values Inventory. Following completion of the entire "Life World 2000" series, the Inventory should be readministered to measure individual and collective changes (if any) in student values.

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1 Permission of Population Education Project, Social Studies Development Center, Indiana University, Bloomington.

POPULATION VALUES INVENTORY

1. Which of the problems below presents the biggest challenge to the United States today?
   (A) Air and water pollution
   (B) Use of energy
   (C) Hunger and poverty
   (D) Population growth
   (E) Consumption of natural resources
2. What do you think is the ideal number of children in a family?
   (A) 0
   (B) 1
   (C) 2
   (D) 3
   (E) 4 or more

FOR EACH STATEMENT BELOW DECIDE WHETHER YOU:

A.....Agree strongly
B.....Agree
C.....Don't know
D.....Disagree
E.....Disagree strongly

3. Most people think only of themselves.
4. Mankind's major problems cannot be solved without formation of a world government.
5. It's nicer to have a big family than a small family.
6. The government should not force unwilling families to practice birth control.
7. The number of children in a family is nobody's business but that family's.
8. Population growth is the main cause of the U. S. enviromental crisis.
9. Our pollution problems can only be solved by destroying our existing institutions.
10. In the space age, man cannot afford loyalty to his own country alone, but to mankind.
11. Most of our actions affect no one but ourselves.
12. The U. S. environmental crisis is largely the result of how people choose to live rather than the size of population.
13. A person's chances for success are higher if he or she comes from a small family rather than a large family.
14. A man's responsibility in life is to his family.
15. It should be illegal for families to have children without first getting permission from the government.
16. The government should pay people to stop having babies.
17. The world would be better off if families didn't have so many children.
18. Most things that happened in the past have little effect on us today.
19. Life, for most people in the world, is getting worse with time.
20. Large differences in population size result from small differences in family size.
21. The birth rate changes very little from year to year.
22. Population increases are good for economic growth in countries like the United States.
23. The desire to have large families has been inbred by billions of years of evolution.
24. The most important factor in population growth is people's desire to have large families.
25. Population growth has made it harder for our government to function smoothly.
26. People in the U. S. could be certain of having a high standard of living even if the population were two or three times as large as it is now.
27. Population growth will prevent many people from raising their standard of living.
28. The U. S. should not worry about population problems in other countries.
29. Foreign countries should not listen to U. S. advice on population.
30. Sending food to help feed people in India probably does more harm than good.
31. Like some countries in the world, the United States is overpopulated.
32. The U. S. should mind its own business and not tell other countries how large or small they should be.
33. Instead of storing surplus food in warehouses, the U. S. should be helping to feed starving people throughout the world.

34. Until the U. S. reduces its own population growth rate, foreign countries probably won't take its advice.
35. The U. S. does not have a population problem.
36. It is better to live in a big city than a small town.
37. The U. S. government should give adoptive parents a special break on their income tax.
38. Do you think a person needs a family to be really happy? Do you think an unmarried person can be equally happy? Choose one.
    (A) Needs a family
    (B) Equally happy on one's own
    (C) More happy on one's own
39. Which of the following would you say is the best age for a woman to marry?
    (A) 18 or younger
    (B) 19-21
    (C) 22-24
    (D) 25-27
    (E) 28 or older
40. What would you say is the best age for a man to marry? Choose one.
    (A) 18 or younger
    (B) 19-21
    (C) 22-24
    (D) 25-27
    (E) 28 or older.

POPULATION KNOWLEDGE INVENTORY

Before the Program Activity 3, page 1.
After the Program Activity 5, page 2.

Administer the following Population Knowledge Inventory prior to the program to determine student knowledge about population change and processes. Record the results on the board for class discussion.

Ask students to retain their individual copy of the Population Knowledge Inventory. Following completion of the entire "Life World 2000" series, the Population Knowledge Inventory should be readministered to measure individual and collective changes (if any) in student knowledge.

Population Knowledge Inventory Key
1. (C). 2. (C). 3. (B). 4. (C). 5. (C). 6. (C). 7. (B). 8. (B).
9. (C). 10. (True). 11. (D). 12. (False). 13. (E). 14. (B). 15. False).

POPULATION KNOWLEDGE INVENTORY

1. The population of the world in 1973 totaled nearly:
   (A) 2.1 billion people
   (B) 3 billion people
   (C) 3.8 billion people
   (D) 4.6 billion people
   (E) 12 billion people
2. The population of the United States in 1973 totaled nearly:
   (A) 75 million people
   (B) 125 million people
   (C) 210 million people
   (D) 530 million people
   (E) 800 million people
3. The population of the United States is growing at the rate of about:
   (A) 0% a year
   (B) 1% a year
   (C) 2% a year
   (D) 3% a year
   (E) None of the above
4. World population is growing at the rate of about:
   (A) 0% a year
   (B) 1% a year
   (C) 2% a year
   (D) 3% a year
   (E) 4% a year

5. The time it will take for the U. S. population to double in size is about:
   (A) 10 years
   (B) 40 years
   (C) 70 years
   (D) 100 years
   (E) 130 years

6. The time it will take for world population to double in size is about:
   (A) 5 years
   (B) 15 years
   (C) 35 years
   (D) 65 years
   (E) 95 years

7. The major reason why world population is growing is because of:
   (A) an increase in the birth rate
   (B) a decrease in the death rate
   (C) an increase in immigration
   (D) a decrease in emigration
   (E) none of the above

8. About what percentage of Americans move each year?
   (A) 10%
   (B) 20%
   (C) 25%
   (D) 30%
   (E) 45%

9. The pattern of migration in America today is primarily:
   (A) rural to rural
   (B) rural to urban
   (C) urban to urban
   (D) urban to rural
   (E) there is no definite pattern

10. Today most Americans live in metropolitan areas?
    True or False

11. What effect over a long term does a small difference in average family size (e.g. 1 child vs. 2 children per family) have on the size of the U. S. population?
    (A) no effect
    (B) a small effect
    (C) a moderate effect
    (D) a large effect
    (E) insufficient information to answer

12. Zero population growth means that all women stop having babies?
    True or False

13. About how long would it take for the population of the U. S. to stabilize (stop growing) if each woman had an average of about two children (assuming no migration)?
    (A) 2 years
    (B) 10 years
    (C) 30 years
    (D) 50 years
    (E) 70 years

14. Today U. S. population growth is generally characterized by:
    (A) a high birth rate and a high death rate
    (B) a low birth rate and a low death rate
    (C) a high birth rate and a low death rate
    (D) a low birth rate and a high death rate

15. The population of the United States is distributed evenly across the country?
    True or False

PROGRAM 2

Is There An Optimum Level Of Population?

PURPOSE: ***To present to students several considerations needed in discussing an optimum level of population for the United States.***

WHAT STUDENTS WILL SEE AND LEARN:

- *Two demographers from a mythical planet use a computer to introduce "optimum" and raise the issue of quantity versus quality.*

  The earth is finite, limited in size, space, and resources; and because of physical and biological limits, infinite population growth is impossible. For these and other reasons, no one is suggesting that population be allowed to grow forever.

  Although almost all concern has been directed toward decreasing the present rate of population growth, some scientists have addressed themselves to the question of defining and finding an optimum level of population for the United States—the best or most favorable under specific conditions—and to spell out "what are we trying to optimize and for whom."

  The problem in attempting a definition of optimum is that people differ on what they consider to be best, on their individual values, and on what values they bring to the situation. Realistically, then, the diversity of individual values makes it impossible to define or find a *single* optimum level of population for any area, for the United States, or for the world.

  There are many different optimums. Each is dependent upon a number of considerations, the most important being people's values, particularly regarding where and how they want to live.

- *Two hobos personalize the issue of values by discussing some of the advantages and disadvantages of large and small populations.*

  If the population of a town is too small, it cannot provide the necessary goods and services commonly associated with a high quality of life: cultural and recreational attractions, specialized medical services and schools, transportation and shopping facilities, etc. That same town, however, may offer a quieter environment in which to live.

  If the population of a town is too large, it contributes to a particular set of social and urban problems: congestion and noise, varying degrees of pollution and crime, etc. On the other hand, the larger town offers specialized attractions and services.

  In choosing where to live, people are willing to cope with some of the disadvantages of one environment so that they can take advantage of the other.

  Specifically, people living in a metropolitan area often seek and use the advantages of the country; similarly, people living in the country often seek and use the advantages of a metropolitan area.

- *The two demographers consider the possible consequences of consumption and population distribution, reinforce the importance of values, and introduce the idea of compromise.*

  While values are the most important factor in defining optimum, they are not the only consideration. One must also look at the size, distribution, and composition of the population, as well as technology and consumption.

  The number of people plus the level of consumption plus the use of technology affect the amount of natural resources used, and consequently the supply.

  Some people cite population distribution in the United States as the basic cause of social and urban problems. However, evidence suggests that there are several causes, many of which are not (or only indirectly) related to population: poor housing, low educational levels, poor economic conditions, unemployment, discriminatory hiring practices, etc.

- *Captain Policy and his sidekick Maynard discover how values necessitate compromise in developing suitable population policies for a broad range of people.*

  The number of people, their distribution, and their values make it impossible to define a single optimum level of population. The fact that values vary among different groups—racial, ethnic, moral, religious, work roles, etc.—makes compromise necessary and inevitable.

  In defining and finding optimum, or as commonly expressed, a situation where the population as a whole enjoys the highest possible quality of life, we must consider several fundamental values. These include supplying each person with the basic necessities of life (food, clothing, and shelter), providing medical care and recreational facilities, survival of the planet as well as survival of individuals and groups, and so on.

Additionally, there are psychological and sociological requirements, including an individual's need for privacy and personal space, as well as so-called abstract values that must be considered: respect for human freedom, dignity, and worth; social justice and welfare; and the right of individuals to develop their own potentialities.

To achieve a higher quality of life, we must first consider individual values and then find a workable methodology. This includes consideration of at least three points of view: the "growth is progress," or "more is better" ethic; the opposing notion of an immediate reduction in the size of the population because we already have more people than we can provide for; and the zero growth concept whereby a nongrowing population affords us time to work on long-range solutions to our problems.

- *Paul Ehrlich and Barry Commoner express their views on an optimum level of population.*
  PAUL EHRLICH: ". . . Given the present behavior of Americans, optimum is considerably smaller than the present size . . . Personally, I suspect the optimum is around one hundred million or less, that is, less than half the present size . . . Fortunately, we should be able to support more people than the optimum over a short range if we are very clever about it and eventually work our way down to an optimum size which can be supported over the long range."
  BARRY COMMONER: ". . . Compute the carrying capacity* of the United States and the amount of food we can produce, and see whether we have too many people for that . . . We do not have too many people for our carrying capacity at the present time . . . There's a social basis on which you can make a choice of an optimum population . . . A matter of public mores . . . I don't think there's any scientific grounds on which to select an optimum population. It's a question of social choice, and each one of us has the right for one vote in that.
- *The two demographers from a mythical planet close the program unable to reach a conclusion about an optimum level of population for the United States.*

SUGGESTED ACTIVITIES:

Before the Program

1. Have students complete the vocabulary exercise on page 9.
2. Define the words *optimum* and *value(s)* for the class. Have students write a short, descriptive paragraph of what they consider to be an optimum way of life, and how their values influence their choice of life styles. Ask volunteers to present their written ideas to the class and elicit discussion. Some hints:
   a. Is the student's idea of optimum characteristic of metropolitan, suburban, or rural living?
   b. Is the student's notion of optimum acceptable to all? Why? Why not?
   c. Do the student's personal values conflict with those of other students? Which ones and why? Do you agree with the student's personal values? Which ones and why? (A raising-of-hands survey might be helpful here).
   d. How can we compromise the situation to make the student's idea of optimum acceptable to most of the class?
3. Aid students in conceptualizing numbers of people, particularly large numbers—thousands versus millions versus billions. Begin by using multiples of the populations with which your students are most familiar, then gradually work up to higher levels. Have students determine how an increase or decrease in numbers could affect the area. a.) What would happen if the population of the classroom suddenly doubled? Tripled? Quadrupled? What additional resources would be needed? (more paper, books, desks, teachers, etc.) How would an increase in the number of students affect you directly? (Disadvantages: less personal space, congestion, greater sharing of resources.) What would be some of the advantages of having more students in the classroom? (Greater sharing of ideas and knowledge, more friends, companionship, specialization, etc.) b.) Expand the idea to include the entire school, the town, the region, the state, the United States, and finally the world. Encourage a broader discussion of the possible effects of these increases on the various areas. Topics might include natural resources, housing, education, medical care, agriculture, government, land use, the environment, and suburban sprawl.

After the Program

- Ask the class to think of several situations where people would be present. Write the suggestions on the chalkboard. Ask students what they consider optimum in each situation and what values they are trying to optimize. Again, solicit challenges from other individuals so students will be aware of the diversity of values. You may use the following situations to start class discussion:
  1. A reading class.
  2. A movie.
  3. A baseball game.
  4. A date.
  5. A classroom.
  6. A family.
  7. A playground.
  8. A picnic.
- Have students compare newspapers (or telephone books) from a large metropolitan area (e.g., *The New York Times, The Chicago Tribune,*

*Carrying Capacity: the amount of food and other resources the area can produce and the number of people and other species it can maintain.

The Los Angeles Times) with those of a small town to determine the relative advantages and disadvantages of large and small populations, and what values students bring to each. Students may use both news stories and advertisements in their comparisons. Before attempting this exercise however, you may want to provide some direction to students. If so, the following examples may prove helpful.

1. Metropolitan Area:
   Positive: A diversity of specialized services—educational, shopping, health, recreational, cultural, home improvement, automotive, ect.; access to public transportation; identification with a broad range of cultural, ethnic, racial, and religious groups; convenience: "something for everyone," "more things to do," etc.
   Negative: congestion, noise, pollution, alienation, separation, social and economic injustices, etc.
2. Rural Area:
   Positive: Neighborliness; individual privacy; town identity and traditions; less pollution and noise; open space; gardening; generally less crime, etc.
   Negative. Boring and dull; lack of specialized services found in the city; generally limited or no public transportation; long drives required to take advantage of attractions found in the city, etc.

> *NOTE: The above activity is an excellent scrapbook exercise for the entire class or as an individual student project.*

- Have two students debate the question of whether there is more privacy in the city or in the country.
- Have each student write a letter to a friend telling him or her the advantages and disadvantages of living in the community. If desired, mail the letters and ask for a reply so that students may compare their values with those of their friend.
- Class survey; make a chart with the following headings: *Urban, Suburban, Rural.* Beneath each heading draw a column line, labeling the left column *Advantages* and the right column *Disadvantages.* Have the entire class participate in determining the advantages and disadvantages of each of the three areas. Similarly, the chart may be used for a values exercise by writing *Likes* and *Dislikes* under each of the three headings.
- Submit the following question for class discussion: "Why would a country or a region want to increase the size of its population"?
  Some examples that might prove helpful:
  To build up its labor force.
  To settle open spaces.
  To have a larger army to make the country more powerful.
  To bolster the economy by exploiting technology.

  What other reasons can your class think of? Are they meaningful and valid? Discuss.
- Role play, classroom discussion, or debate: the Ehrlich/Commoner points of view.
  For Ehrlich Supporters: What formula did Ehrlich use to come up with an optimum population of one hundred million people or less?
  For Commoner Supporters: "As rational beings, don't we have a responsibility to future generations to leave the earth at least as clean and healthy as we found it? When each individual pursues his own desires, will the larger societal goal necessarily be achieved"?
- Invite a student from the city and a student from the country to present to the class a debate on the question: "Which environment is optimum"? Ask the class to determine the values each debater brought to his or her argument.
- Reproduce and distribute to the class the article on page 10: "Is There An Optimum Level of Population?" by S. Fred Singer. The article may be used for informative purposes or for class discussion.
- Reproduce and distribute the chart, "One Thousand Years of Population Growth," page 55.

PROGRAM 2

VOCABULARY EXERCISE

Unscramble the population-related words listed below and match them with their correct definition.

PUNTILOOPA	TUPMOMI
ZIMAXEIM	VEALU
CROPIMMOSE	RYCINGAR APACTYIC

A. Relative worth, utility, or importance.
B. The maximum number of people the earth, a country, locality, etc., can provide for.
C. The body of inhabitants (e.g., people, rocks, plants, animals) in a given area at a given time.
D. To adjust or settle by mutual concessions.
E. To increase to the greatest quantity or value attainable.
F. The best or most favorable under specific conditions.

KEY

POPULATION (C)	OPTIMUM (F)
MAXIMIZE (E)	VALUE (A)
COMPROMISE (D)	CARRYING CAPACITY (B)

PROLOGUE

Is There an Optimum Level of Population?[1]

by S. Fred Singer

We have become so conditioned to the inevitability of population increase that almost all concern has been to decrease the rate of increase. Only occasionally has the question been raised as to whether we have attained or even passed an optimum level of population.[2]

To start with, is the question itself meaningful? We need to define the word "optimum" and to spell out "optimum for what?" This itself becomes a valid subject for discussion, but perhaps we can sidestep this point for the time being by redefining "optimum" as the situation in which the population, as a whole, enjoys the highest quality of life. This means, of course, that each person receives an adequate amount of food; is adequately supplied with the necessary raw materials to make the things and devices he needs (including such nonrenewable resources as metals); that there is an adequate supply of energy, as well as water and air of high quality. But, in addition to the so-called necessities of life, there are other requirements: adequate medical care to insure good health; recreational facilities, especially outdoors; and cultural outlets. Then there are sociological and psychological requirements, including a requirement for space and privacy.

Heuristic arguments can be a guide in arriving at a meaningful discussion. Take, for example, a town. If the population is too small, then it cannot provide all the necessary services which produce a good life: cultural facilities, hospitals, and so on. And we are all familiar with the consequences of too large a population in a city, or at least in the present, over-crowded city. Intuitively then, one feels that there must be an optimum of population—perhaps a broad optimum; and one feels that this concept could also apply to a region and to a country, and perhaps to the world.

For the purposes of the present discussion, let us confine our attention entirely to the United States, since we are interested only in investigating a methodology. It is not necessary, therefore, to involve ourselves in foreign problems.

In the United States, the production of food does not really provide a meaningful upper limit to the population. In other words, the upper limit is so high that other considerations would give a lower value. (While hunger is a very serious matter, it is due to a poor distribution system and to poverty of a segment of the population, rather than to the ability to produce food.) Rather than ask the question: "How large a population can agricultural production support?", one can reverse the question by inquiring how few people it would take to feed a population of a given size, now and in the future. One would find, I imagine, that as the level of population increases, the fraction of people involved in agriculture would drop down to an asymptotic limit, all other factors being equal. One could show that economies of scale allow one to manufacture food more efficiently in larger quantities. On the other hand, there comes a point when high-quality agricultural lands are exhausted and further production has to be carried on at a lower level of efficiency. A determining factor, of course, is advances in technology and in agricultural science: the former providing such essentials as water, fertilizer, and perhaps even carbon dioxide at lower cost; the latter developing plants that more efficiently convert the essential raw materials into food.

From a similar point of view, one could discuss the limitations introduced by mineral and other resources, and by manufacturing, and by the problems of air and water pollution which depend not only on level, but also on concentration of population. Fairly well-defined limits can be set, for example, to the capacity of streams to support the acceptance of treated chemical wastes and of thermal wastes. Furthermore, costs increase rapidly with the higher degree of treatment which becomes necessary as the population density rises.

One of the most important subjects is energy, since it forms the base for many of the other considerations. For example, with cheap and abundant energy, it is possible to produce food by nonconventional means, or to purify air and water economically to a very high degree. Social and health services can also be discussed in a fairly quantitative manner. Demographic trends can be documented, such as a lowering of the average age of the population, and a relative increase in those groups who tend to have a higher birth rate. These trends, which can lead to important consequences in our society, depend not only on the absolute level but also on the rate of increase of population. Adequate educational and health services may provide a significant bound to achieving a full and healthy life for an ever-increasing population. Perhaps there arises, also, fundamental biological problems as the level of population goes beyond certain limits.

Other factors, such as sociological and psychological requirements, can probably be discussed only in a semiquantitative way. But no one can deny the existence of a human need for cultural outlets and for recreation, much of it out-of-doors, or the need for space and privacy, again with an emphasis on natural outdoor environments.

Which of the factors provide a "lowest upper limit" to the level of population? How do these various factors interact with each other? What research needs exist? Can at least portions of the problem be handled by mathematical simulation? What are some of the philosophical, ethical, and political

1 *Is There an Optimum Level of Population?*, S. Fred Singer, ed., McGraw-Hill Book Co., New York, 1971.

2 J. J. Spengler. "Population Optima." *The 99th Hour*, Daniel O. Price, ed., Chapel Hill: University of North Carolina Press, 1966.

considerations in striving for an optimum population level?

A discussion of such questions cannot do much more than open up the problem. It is clear that it will not answer the question of what is an optimum level of population. However, we can hope for at least the development of a methodology which will allow us to pursue the major question in a fruitful way. It will also lay the groundwork for the considerations of the Commission of Population Growth and the American Future which has been proposed by President Nixon to conduct an inquiry into the policies which the government should adopt. The time seems to be ripe for an examination of this question which is so fundamental to the well-being of the nation, and indeed of the whole world.

FACTS AND FIGURES FOR TEACHERS

WORLD POPULATION 1973
(approximate)
3.8 Billion

U.S. POPULATION 1973
(approximate)
210 Million

Source: Population Reference Bureau

WORLD POPULATION 1973
The 10 Largest Countries

Country	Population (in millions)
People's Republic of China	799.3
India	600.4
USSR	250
United States	210.3
Indonesia	132.5
Japan	107.3
Brazil	101.3
Bangladesh	83.4
Pakistan	68.3
Nigeria	59.6

Source: Population Reference Bureau

U.S. POPULATION 1970
The 5 Largest States

State	Pop.
California	19,953,134
New York	18,241,266
Pennsylvania	11,793,909
Texas	11,196,730
Illinois	11,112,976

Source. U.S. Bureau of the Census

U.S. POPULATION 1970
The 5 Smallest States

State	Pop.
Delaware	548,104
Nevada	488,738
Vermont	444,732
Wyoming	332,418
Alaska	302,173

Source: U.S. Bureau of the Census

STUDENT MATERIALS

Reproduce and distribute to the class for discussion. Or have students summarize the two articles in their own words.

1. The life style of Californians, characterized by increasing demands for goods and services, would strain the resources of the state even if population growth were drastically reduced. Moreover, the high cost of maintaining additions to our population at current levels of living also diminishes our ability to improve the conditions of life for those who are poor. And as congestion becomes greater, a higher and higher proportion of income will have to be expended simply to avoid or mitigate the nuisances, poisons, and waste products of more people consuming more goods within the confines of the same space and basic resources.
   California Population Problems and State Policy, A Report to the Assembly General Research Committee, California Legislature, Dec., 1971, P. 9.

2. REDWOOD CITY, Calif. (According to 41% of the residents polled in the area) the quality of life is deteriorating. Overpopvelopment (sic) and the associated problems of water, air, and noise pollution, crime, traffic congestion and high taxes were cited as reasons for this opinion. The 26% who said the county was becoming a better place to live cited highways, schools, government services, convenient shopping facilities, and jobs.
   From: *The New York Times*, Oct. 26, 1972.

PROGRAM 3

Trends

PURPOSE: ***To introduce students to concepts which are useful for greater understanding of how populations change.***

WHAT STUDENTS WILL SEE AND LEARN:

• *Two young people review birth rates and death rates during the history of the world and the United States and explain the use of these demographic tools.*

Demography is the analysis and description of human population groups in terms of distribution, vital rates (birth rates, death rates, growth rates, etc.), age and sex, religious and ethnic composition. Demographers, scientists who study human populations, use a number of measurements which enable them to better understand how populations change. Two of these are:

the birth rate: the number of births per year per 1000 people.

the death rate: the number of deaths per year per 1000 people.

Birth rates in individual countries vary and have gone up and down in history, but when all are averaged together, the birth rate for the world has slowly declined.

Prior to 1800, both the birth rate and death rate were high. Then, beginning in the 1800's and continuing through the 1900's, new medical, surgical, and health practices as well as better nutrition and improved sanitation facilities helped to reduce infant and child mortality, cure diseases (such as smallpox), and raise the average life expectancy. As a result of this "death control" (notably after 1950 in the developing nations), the death rate fell faster than the birth rate, resulting in a growing world population. Even today, world population is growing largely because of a big decline in the death rate.

Similarly, the death rate in the United States has declined faster than the birth rate. In frontier America, parents averaged 8 children, partially because most people farmed and children were needed to help work the land. Additionally, a high rate of infant and child mortality necessitated high levels of fertility that acted as a counterbalance. At that time, society could control fertility facors—e.g., early marriages—better than those for mortality. But with the introduction of measures to perpetuate life, the death rate declined. This was followed closely by industrialization and mechanization during the nineteenth and twentieth centuries that lured people from the farms to better paying jobs in the cities. People generally enjoyed a higher standard of living; and on the average, parents desired fewer children. Consequently, both the birth rate and death rate declined (the latter falling faster), establishing a trend that has continued to the present. There have been some exceptions; The birth rate reached a low point during the depression and a peak in the post-World War II boom years. But the overall birth rate trend has been one of decline.

• *Barry Commoner explains the Demographic Transition.*

"Historically, a declining birth rate and death rate is characteristic of most developed nations in the world. This process, going from a high birth rate/high death rate to a low birth rate/low death rate is known as the Demographic Transition.

No country in the world has gone through the Demographic Transition completely (where births equal deaths for more than a few years), but most developed nations are close.

Developing nations have gone partially through the Demographic Transition in that "death control" has lowered their death rates, but their birth rates have remained high, resulting in rapid population growth. This growth will continue for the next several years no matter what reasonable measures are taken to try and stop it."

• *A secret agent demonstrates why growing populations have momentum.*
(See related article on page 15 "Momentum" by Andrew Leighton.)

A growing population has momentum, as a moving body has momentum, which means it cannot stop growing immediately because the present larger generation of young people will still have to pass through their own reproductive years, resulting in children of their own.

Assuming no migration, if women would start and continue to average two children (replacement fertility, the children who were the result of the post-World War II "baby boom" would keep the population of the United States growing for about 70 more years before the size of the population would stabilize.

• *Aesop teaches a youngster how to compute Doubling Time (the time it takes for a population to double in size):*

Populations grow geometrically (2, 4, 8, 16, etc.) much like money in the bank earning compound interest.

The doubling time of a population may be approximated by dividing the growth rate into the number 70. Thus, at its present rate of growth (2% in 1973), world population will double in about 35 years, and U.S. population (1% in 1973) in about 70 years.

• *A fortune teller defines and explains the use of Projection and Prediction in forecasting population* trends.

Given reasonable assumptions based on present data, population trends can be *projected* into the future with mathematical accuracy. However, caution should be taken in accepting *projections* as absolute facts. Because present trends fluctuate daily and future trends cannot be accurately identified, *predictions* about population trends are risky. A *prediction* may be nothing more than a guess. And a *projection* is not a *prediction*.

• *A contemporary youngster challenges Thomas Malthus' "Theory of Population"*

In 1798, Thomas Malthus, an English economist and clergyman, wrote of population: "The power of population is indefinitely greater than the power in the earth to produce subsistence for man . . . Population, when unchecked, increases in a geometrical ratio: Subsistence only increases in an arithmetical ratio."

The Malthusian theory assumed that growth rates for both population and agriculture would remain constant, thus leading him to conclude that eventually population would outstrip the world's supply of food, geometric growth being more powerful than arithmetic growth. Malthus did maintain, however, that there were some built in "natural checks" that would place an upper limit on population growth—natural disasters (floods, earthquakes, etc.), wars, famines, and so on. But here again, his assumptions were erroneous. Consequently, by ignoring changing technology and advances in the agricultural sciences, and by assuming constant growth rates, Malthus was using his projection as a prediction based on faulty assumptions.

• *The secret agent reinforces the fact that population is growing because of a big decline in the death rate.*

SUGGESTED ACTIVITIES:

Before the Program

1. If desired, have students complete the vocabulary exercise.

2. Class discussion: What is a trend? You may first want to use concrete examples before moving to abstractions, e.g. trends in fashion, hair styles, music, automobiles, TV programs, etc. When students understand the concept of a trend, begin to introduce population-related issues, e.g. family size, metropolitan dispersal, prolongation of life, etc.

3. Discuss how changing values might start or influence a trend.

After the Program

1. Have the class suggest factors that cause change in populations in general, such as births, deaths, and migration; then move to more specific factors. Some examples are: famine, war, literacy, nutrition, disease, medicines, technology, employment, mobility, higher age at marriage, women working, housing, and so on.

2. After citing other factors that caused the death rate to decline, have the class discuss the positive and negative effects of "death control" on society. As a starting point you may want to use the following examples: social security, medicare, pension plans, nursing homes, geriatric specialists, pediatricians, child care facilities, and schools.

3. Have students research and construct an age distribution pyramid for their city or town. See page 57 for an example of an age pyramid. Most public libraries will have the necessary statistics. Students should examine the pyramid and discuss its present and future implications for the town. Some questions you might raise:

   (A) What age group makes up the largest portion of the population?

   (B) Can you think of any reasons which may account for this? A surge in births in the past? Decrease in deaths? Both?

   (C) What does the present age structure mean for your town? What kinds of facilities and expenditures are needed?

   (D) What does it mean for the future? Will there be more or less people? Will there be a greater requirement for schools or homes for the elderly?

   (E) What would happen in the future if the present generation of young people in your town decided to have only two children when and if they marry? (Assume no one will move in or out of town.)

4. Compare the age pyramid constructed in Activity 3 with one from another town or city in the state. Again, students should research and construct the second pyramid on their own. Some questions which might be helpful:

   (A) Look at each pyramid. How does the size of the population under 15 compare with that over 65?

(B) What might account for the differences?

(C) What might account for the differences in the shape of the two pyramids?

(D) Based on the two pyramids, what kinds of facilities and expenditures are needed for each town? What are the differences and why?

5. Have students perform similar comparisons using the age pyramids constructed in the above activities with the one on page 57 of this guide, "Age Distribution in the United States." If Activities 3 and 4 are not used, students should examine the U.S. age distribution pyramid, adapting the previous questions to apply to the entire country.

6. Have students research and collect 50 years of population data for their town or city. Concentrate on births, deaths, and migration. Use the B-D + I-E formula to compute the historical rate of population change and plot it on a graph. Students should then determine what changes it has brought to the community. To start, students should obtain maps from various census periods and compare population change, density, distribution, and so on, in the community. Determine what this has meant for the town: schools, housing, jobs, land, shopping facilities, retail sales, public transportation, roads, and automobiles.

   Students may then research actual statistics to see how their conclusions compare; e.g., actual construction, miles of highway paved, additional classrooms built, etc.

7. Using reasonable assumptions about the data compiled in the previous activity, students should compute and plot on a graph a five year projection of population change for the community and determine any foreseeable changes in goods and services. Some hints:

   (A) Based on your projection, will the area need more highways or better public transportation; houses or apartments, etc.?

   (B) Defend the validity of your projection. Are your assumptions reasonable?

   (C) What would happen to your projection if:

      1. The economy slumped and unemployment rose?
      2. If company "X" moved out of town?
      3. If company "Y" moved into town?

8. Read the following statement to the class.

   "In his second message to Congress, Abraham Lincoln predicted the U.S. population would reach 251,689,914 in 1930."

   -Darrell Huff, "How to Lie with Statistics," New York: W. W. Norton, 1954, p. 142.

   (A) Ask students if they think Lincoln's prediction was correct? Why or why not?

   (B) What assumptions do you think Lincoln used to make his prediction?

   (C) Point out to students that by 1930 the population of the United States was only 122,487,000. Why was Lincoln's prediction erroneous? Was it really a prediction, or was it a projection based on faulty assumptions?

   Now read the following statement to the class and elicit more specific comments about projection and prediction.

   "Predictions about fertility are always dangerous—which is why no one population projection should ever be taken too seriously."

   -Stephen Enke, "Population Growth and Economic Growth," *The Public Interest*, 1973.

9. Use the following paragraph to illustrate the weakness of the Malthusian theory of natural checks:

   "In 1970, a cyclone struck East Bengal (now Bangladesh), killing about 500,000 people. The population of East Bengal at that time was growing so fast, it took only 40 days to replace the people who were killed."

10. Class discussion: Why are only births and deaths used to compute population change on a world level? Reproduce and distribute chart, "Birth and death rate per 1,000 population: U.S., 1910-70," page 56.

11. Use cusinaire rods to demonstrate the difference between geometric and arithmetic growth. Afterwards, have two students role play the Aesop segment while the rest of the class computes each day's wages, e.g., 1 cent on the first day, 2 cents on the second, 4 cents on the third, etc. Periodically the person working for Aesop should turn to the class and say:

    "It is now the 5th day. How much money have I made? . . . Now the 9th day . . . 17th day, etc."

    The class may respond in unison or individually.

12. Reproduce the arithmetic formulas on page 16 and distribute to students for problem solving exercises and future reference.

13. Refer again to the chart distributed in lesson 2, "One Thousand Years of Population Growth," page 55.

MOMENTUM

by Andrew Leighton

If each woman in a growing population decided to have no more than two children (replacement fertility), would population growth immediately stop? The answer is no! Increases would continue because of the "momentum" built up by the growth of the present generation.

For example, in developing countries with high fertility, there are a great many young children in relation to the total population. As these children move into their reproductive years (ages 15-44), the age group (or cohort) that has been having babies grows too old to have more. But because the younger cohort is more numerous than the older one, there will be more of them with the opportunity to experience parenthood. Even if they are less fertile than their parents, they will probably produce more children altogether.

In the United States, the momentum of population growth can be seen in the aftereffects of the post-World War II baby boom. Here the rapid growth was caused not by a sharp drop in mortality, as in the case of the developing world, but by a sharp increase in fertility. Population continues to grow despite the fact that the average number of children in each family has dropped below the replacement level for the first time in history.* The reason for this apparent contradiction is that the large numbers of children produced during the baby boom (1947-1965) are now entering their reproductive years and producing families of their own. To illustrate, in the two decades before 1965, about 48 million Americans reached the age of 20; between 1965 and 1985, over 78 million will reach that age.** The larger absolute numbers of potential parents in the post-World War II generation is the reason for the continued growth of this nation's population. We may be through with the past, but the past is not through with us.

PROGRAM 3

VOCABULARY EXERCISE

Unscramble the population-related words listed below and match them with their correct definitions.

RAGHOMPEDY	GHOPERDEMAR
PUNTILOOPA	TIBHR TERA
THADE ARET	THOWGR TEAR
LAMOTIRTY	THADE TRONCOL
LEIF ECANETXYPC	UMTOMNEM
ORPNOIEJTC	CRIPEDIONT
POSSUMATIN	SISTESUBCEN
COGMIETER	THEMICARIT

A. A progression of numbers as 1,2,3,4, etc. (See glossary.)

B. Pertaining to deaths.

C. Statistical analysis and description of human population groups in terms of distribution, vital rates, age, and sex.

D. To declare what will happen in the future.

E. The number of live births in one year per 1,000 mid-year population.

F. The minimum necessary to support life.

G. The degree to which a population grows or declines annually, expressed as a percent.

H. A scientist who studies human populations.

I. The scientific carrying forward of trends from the past and/or present, making assumptions about their continuation.

J. Under given mortality conditions, the average number of years of life remaining to males or females of a specified age.

K. A statement taken as granted or true; supposition.

L. The body of inhabitants (e.g., rocks, plants, people) in a given area at a given time.

M. The progression of population growth, as 2,4,8, etc. (See glossary.)

N. The practice of controlling deaths in a population.

O. The number of deaths in one year per 1,000 mid-year population.

P. A property of a moving body that determines the length of time required to bring it to rest when under the action of a constant force or movement.

KEY	
DEMOGRAPHY (C)	DEMOGRAPHER (H)
POPULATION (L)	BIRTH RATE (E)
DEATH RATE (O)	GROWTH RATE (G)
MORTALITY (B)	DEATH CONTROL (N)
LIFE EXPECTANCY (J)	MOMENTUM (P)
PROJECTION (I)	PREDICTION (D)
ASSUMPTION (K)	SUBSISTENCE (F)
GEOMETRIC (M)	ARITHMETIC (A)

*The New York Times, March 2, 1973, p. 1.

**Population and the American Future. The U.S. Commission on Population Growth and the American Future, John D. Rockefeller III, Chairman. U.S. Government Printing Office, Washington, D.C. 1972, p. 22.

FORMULA PAGE

Births-Deaths = World Population Change.
Births-Deaths + Immigration-Emigration = Population change for any area smaller than the world.

$$\frac{\text{Number of Births per Year}}{\text{Population}} \times 1000 = \text{Birth Rate}$$

e.g.* $\frac{3{,}356{,}000}{209{,}717{,}000} \times 1000 = 15.6$

$$\frac{\text{Number of Deaths per Year}}{\text{Population}} \times 1000 = \text{Death Rate}$$

e.g.* $\frac{1{,}964{,}000}{209{,}717{,}000} \times 1000 = 9.4$

$$\frac{\text{In Migration-Out Migration}^{**}}{\text{Population}} \times 1000 = \text{Net Migration Rate}$$

e.g.* $\frac{358{,}000}{209{,}717{,}000} \times 1000 = 1.6$

$$\frac{\text{(Birth Rate-Death Rate + Net Migration Rate)}}{10} = \text{Growth Rate in \%}$$

e.g.* $\frac{15.6-9.4+1.6}{10} = 0.78\%$ (at that time, 197., the lowest in U.S. History)

$$\frac{70}{\text{Growth Rate}} = \text{Doubling Time (approx.)}$$

e.g. $\frac{70}{.78} =$ Approx. 90 Years

*Statistics from: Current Population Report, United States, 197?, Population Estimates and Projection, Bureau of the Census, May 1973.

**Accurate statistics are not maintained for emigration. Most migration figures are already combined, i.e. most statistics will provide a Net Migration figure (In Migration-Out Migration).

STUDENT MATERIALS

Reproduce and distribute to the class the following. Discuss individually or collectively.

"Regardless of what happens to the birth rate from now on, our past growth commits us to substantial additional growth in the future. At a minimum, we will probably add 50 million more Americans by the end of the century, and the figure could easily be much higher than that.

"We will be living for a long time with the consequences of the baby boom. Not long ago, that surge of births caused double sessions, schools in trailers, and a teacher shortage. Now it is crowding the colleges and swelling the number of people looking for jobs. As these young people grow older, they will enter the ranks of producers as well as consumers, and they will eventually reenter dependency—the dependency of the aged.

"We are going to have to plan for this."

-Population and the American Future, 1972, p. 75.

PROGRAM 4

Migration

PURPOSE: ***To demonstrate to students that migration is an essential factor in population change.***

WHAT STUDENTS WILL SEE AND LEARN:

- *Adam and Even introduce the word "migration," followed by an animated sequence illustrating how increased mobility contributes to migration and ending with the formula for computing population change for any area smaller than the world.*

  Births-Deaths + Immigration-Emigration = Population Change for areas smaller than the world.

- *A montage of photographs capsulizes migration in American history.*

  The United States is a nation of immigrants. More than 350 years ago, Europeans began settling along the east coast of North America, hoping to find riches and individual freedom. By the end of the eighteenth century, new immigrants pushed from the crowded Eastern seaboard into the Shenandoah Valley, breached the Appalachians at Cumberland Gap, and floated across the rivers into the Ohio Valley. In the next fifty years they crossed the Mississippi, rumbled down the Santa Fe, crossed the Rockies on the Oregon Trail, and raced to the Pacific, renewed by the cry of, "Gold!" In the years that followed, they settled the Midwest, a last stronghold of the American Indian.

  With the Industrial Revolution and new mobility, the cities flourished, reversing the migratory pattern of the last three hundred years, from rural to rural to urban.

  Today migration in America is urban to urban, with one out of five people, or approximately 20% of the population, moving each year.

- *A youngster on-the-road defines immigration and emigration.*

  About 400,000 people immigrate to the United States each year, accounting for almost 1/5 (20%) of America's yearly population growth. Although accurate statistics are not kept for emigration, indications are that it has been increasing recently from about 23,000 in 1965, to about 37,000 people in 1970.

  People migrate for verious reasons, including survival, political or religious, economic gains, force, war, and change of environment.

- *A montage of photographs capsulizes the Irish immigration to America in the 1840's and 1860's.*

  The Irish immigration to America in the 1800's is an example of migration for survival. In 1845, a blight wiped out the potato crop, a staple in the Irish diet. A widespread famine swept over Ireland. Disease reached epidemic proportions, and more than a million people died. Because the land now symbolized oppression and starvation, many Irish men and women jumped at the chance to emigrate from the country when landlords offered to pay their boat passage. By 1860, more than a million and a half Irish had immigrated to the United States.

- *A montage of photographs capsulizes the Dust Bowl emigration in the 1930's.*

  The dust bowl emigration from Oklahoma to California is an example of forced migration due to natural causes. In 1935, dust storms brought catastrophe to many midwestern states. Unable to sustain themselves on the land, caravans of people migrated west, mostly to California (a state then regarded as a land of milk and honey).

- *A life-long resident of an American small town talks about the decline in its population over the years.*

  The population of many American small towns is declining; and, consequently, once prosperous towns are now dying. In 1900, rural population was 46 million or 60% of the total population of the United States. By 1970, it was only 26% of the total, increasing by only 8 million people in 70 years, while the total national population had nearly tripled.

  Between 1960-1970, the following states had the greatest declines in population: West Virginia—6.2%; North Dakota—2.3%; South Dakota—2.1%; Washington, D.C.—1.0%.*

- *A pitchman tries to promote the theory of interplanetary migration as a method of containing population growth.*

  Immigration and emigration have had no effect on the total population of the world. It would have an effect if large numbers of people migrated from the Earth, or if life on other planets immigrated to the Earth.

  Present standards of technology make large-scale interplanetary migration both impractical and impossible. At least 200,000 people would need to emigrate at the same time just to reduce what is today one day's increase in world popu-

*Statistics from *We The Americans, Who We Are*, U.S. Bureau of the Census, p. 6.

lation; costs would be prohibitive; it would require at least ten generations of travel time to find a planet capable of supporting human life (assuming one exists); and the society aboard the vessel would have to be tightly regulated lest the craft become "overpopulated."

SUGGESTED ACTIVITIES:

Before the Program

1. If desired, have students complete the vocabulary exercise.
2. Survey the class to determine how many have moved during their lifetime and, to the best of their ability, their parents' reasons for moving. Compile a list of these reasons and save for discussion after the program (See after Activity 4). Some students may want to go a step further and chart a family tree.
3. Reproduce the migration history survey on page 19. Distribute to students a day or two in advance of the program so that they may complete the form and bring it with them on the day of the telecast.

   CAUTION: In some communities, the information needed to complete the migration history survey may be considered sensitive or an invasion of individual and family privacy. Prior to initiating the activity, we suggest the matter be discussed with parents and school officials. Emphasize that migration, as a significant component of population change, influences our behavior as a population actor. For this reason, students should fill out this and all similar forms anonymously.

After the Program

1. Discuss the questions listed on the migration history survey (if used).
2. Have half of the class, as advertising specialists, write, design, and lay out a series of ads to encourage in-migration to the community. The rest of the class will role-play people from various walks of life (such as: businessmen or woman, farmer, teacher, retired person, industrialist, doctor, musician, recent college graduate, and young married couple) as they react to the ads.

   Pose these questions to role-playing students:

   (A) Would the ads induce you to move into the community? Why or why not?
   (B) What "sales pitch" would you use?
   (C) Suppose the ads were successful and 10,000 additional people moved into your town? What changes would occur? What problems would occur?
   (D) Suppose the ads were unsuccessful and people kept moving away from the community? What measures would you take to stop the flow of emigrants?
3. Creative Writing Assignment: "If I could, I would migrate to ....., because ....."
4. Brainstorm: "Why people migrate." Expand the list presented earlier, starting with the results of the survey conducted in Before the Program Activity 2.
5. Role Play: City or state government officials attempting to stop the decline of the population of a small town. What can be done on a government level to encourage in-migration?

   (A) Should more industry (jobs) be brought in?
   (B) Are our educational facilities adequate?
   (C) Do we need more cultural, recreational, and shopping facilities?
   (D) Should the town encourage tourism?
   (E) What are the consequences of bringing in more people, supplying additional jobs, providing more housing, etc. Consider: Taxes might increase as incomes increase, but so would costs for municipal services and schools. How would you handle this?
6. Duplicate and distribute to students for their review the paragraph and chart on page 21. Then ask the following questions:

   (A) Count the years when migration contributed more than natural increase (births minus deaths) to California's population growth. What is the significance of this?
   (B) What accounts for the high number of migrants to California from 1941 through 1945?
   (C) Between 1947 and 1950, natural increase exceeded migration. What caused this?
   (D) Why has California had such a high level of migration?
   (E) Where do you think most of the immigrants settled in California? In urban, suburban, or rural areas? What changes does this bring to a community?
   (F) Should California begin to discourage in-migration? Why? Do you think they should promote out-migration? Why?
   (G) What does California's past migration mean for its future?
   (H) From the text, we learn that "The state (California) already has over one-quarter of the foreign-born population of the United States." How might this fact influence changes in a community?
7. A temporary move is not a migration. The move must be made with the intention of establishing a permanent place of residence. In the following situations, students should determine whether they have immigrated, emigrated, or migrated.

(A) If you move to another state, you have .....

(B) If you live in France and decide to leave permanently, you have ..... from the country.

(C) If you live in France and move to America, you have ..... to the United States.

8. Issue: If population stabilization is a worthwhile goal, realizing that immigration accounts for nearly 20% of our annual population growth, should we consider severely restricting immigration? If so, who should we allow to immigrate to the U.S.?

(A) Persons who are being persecuted or discriminated against in other countries?

(B) Persons exiled from nationalist states who want only natural citizens living within the country?

(C) Individuals who have families in the U.S. who are American citizens?

(D) Political refugees who seek asylum?

(E) Anyone who wants to come (until the specified quota is filled)?

What criteria should be set up for admitting peopeople into the United States?

(A) Education?
(B) Economic status?
(C) Job skills?
(D) Other?

What about the words on the Statue of Liberty and America's image as a "melting pot" for all peoples?

MIGRATION HISTORY SURVEY

(1) ANCESTORS	Birthplace	Present Residence	Age (if deceased, give age at death)	Number of Children
Grandparents:				
Mother's mother				
Mother's father				
Father's mother				
Father's father				

QUESTIONS:

How might your grandparents affect you? If they were born in a foreign country, do you have any of their ethnic characteristics? Do you speak their native language; enjoy their traditional foods; have any of their customs? Did they live in an urban or rural area? Did this influence where your parents lived, or your thoughts about where you live now, or where you might want to live in the future? If your grandparents are still alive, do you visit them often? If so, what do you enjoy during your visits? Do you think you will live longer than your grandparents? Why?

(2) PARENTS	Place of birth	Age at Marriage	Year of Marriage	Present Age
Mother				
Father				

I have _____ brothers, _____ sisters, and am the _____ (2nd, 3rd, etc.) child born in my family.

(3) WHERE HAVE YOUR PARENTS LIVED BEFORE YOU WERE BORN?

Place	Rural	Urban (check one)	Surburban	Reason for moving.

QUESTIONS:

When were your parents married? Do you think that period in history (when they married) influenced their decision on family size? Why? Did your parents migrate for reasons other than change of environment or economic gains, (e.g. wars, depressions)?

(4) WHERE HAVE YOU LIVED?

Place	Rural	Urban (check one)	Surburban	Likes or Dislikes

QUESTIONS:

How has migration changed your life? You've been to new schools, met new friends, found new playgrounds. What do you think about this?

VOCABULARY EXERCISE

Unscramble the population-related words listed below and match them with their correct definition.

TERMIGA	GRAINTOMI
GRIMANT	TOMMIRANIGI
NAMEITRIGO	MIMIAGTER
AGRITEEM	GRIMMITAN
RANTMGEI	

A. To move to another area with the intention of establishing permanent residence.
B. The act of people moving out of a country permanently.
C. The act of migrating.
D. To move out of a country permanently.
E. To move into a country permanently.
F. A person who migrates.
G. A person who emigrates.
H. The act of people moving into a country permanently.
I. A person who immigrates.

KEY

MIGRATE (A)	MIGRATION (C)
MIGRANT (F)	IMMIGRATION (H)
EMIGRATION (B)	IMMIGRATE (E)
EMIGRATE (D)	IMMIGRANT (I)
EMIGRANT (G)	

STUDENT MATERIALS

After reproducing and distributing the two statements to the class, have students summarize in their own words the meaning of each statement.

I. "Prominent among traditional American values is freedom of movement, yet blacks and other minorities are restricted in their mobility, especially from city to suburb. Access to high quality education is considered a right of all Americans, yet many rural poor living in depressed regions have inadequate skills. Environmental quality is a national goal, yet high pollution levels are common in large metropolitan areas and in some smaller urban and rural places as well."*

II. No one country could contain enough people to alleviate world population concerns.

PROGRAM 4: MIGRATION

FACTS AND FIGURES FOR TEACHERS

MIGRATION 1960-1970*

Gained the Most People

California	2,100,000
Florida	1,300,000
New Jersey	500,000
Maryland	400,000

Lost the Most People

Pennsylvania	400,000

Source: U.S. BUREAU OF CENSUS.

U.S. URBANIZATION*

Years	% Urban
1890's	35%
1910's	46%
1930's	57%
1950's	60%
1970's	74%

Source: U.S. Bureau of Census, 1970.

*The U.S. Commission on Population Growth and the American Future, 1972, p. 118.

After the Program

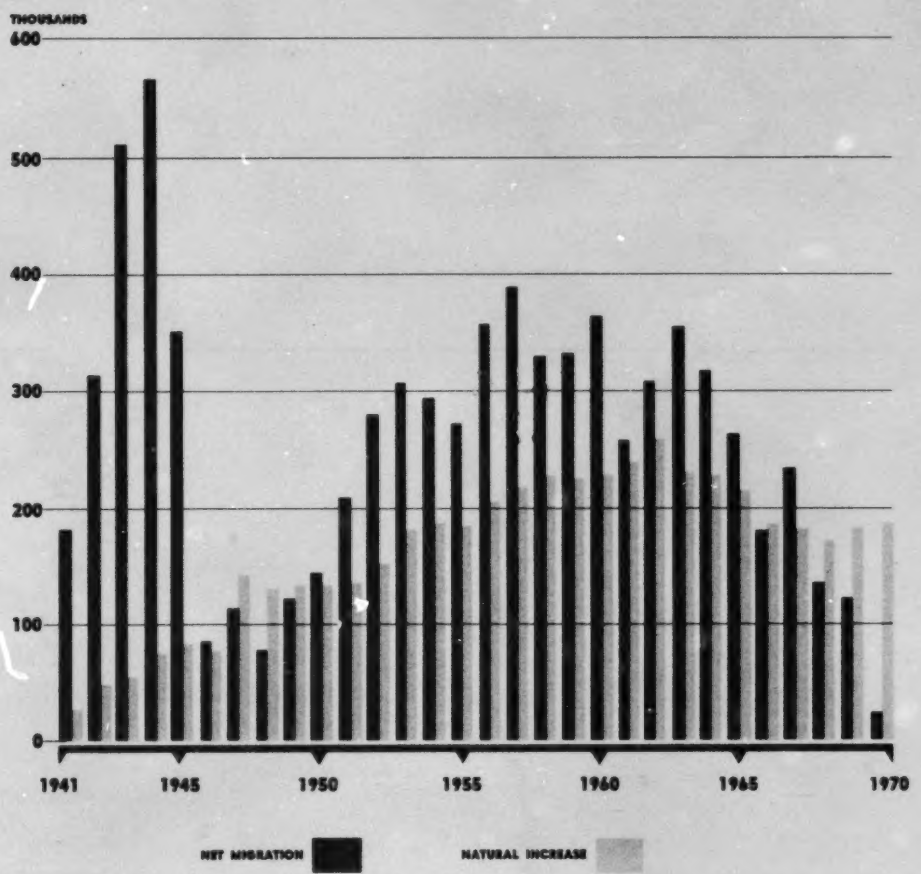
Activity 6

"Since 1860, California has experienced the fastest average growth of any state and is now the most populous state in the nation. The present population of over 20 million constitutes almost 10% of the population of the continental United States.

"In terms of distance and movement of people, California has been the focal point for the greatest migration in human history. (See Chart on following page.) At present, migration into the state appears to be on the wane. From an average increase of 255,000 persons annually during the decade of the 1960's, net migration has decreased to an estimated 26,000 in 1971. However, the number of migrants entering and leaving California annually is extremely susceptible to short-term change, and there are large pools of migration-prone population in urban areas of the country who will flow into the state in response to improved economic conditions. Moreover, California is becoming increasingly attractive to foreign immigrants. The state already has over one quarter of the foreign born population of the United States, and the percentage of immigrants specifying California as their intended state of residence continues to increase. All evidence indicates that continued migration must be considered a significant factor influencing not only the magnitude of the state's growth, but also the structure and character of the population."

California Population Problems and State Policy, A report to the Assembly General Research Committee, California Legislature, December 1971, p. 4.

THE PATTERN OF CALIFORNIA'S ESTIMATED NET CIVILIAN MIGRATION AND NATURAL INCREASE 1941-1970



Source: California Department of Finance, Population Research Unit.

PROGRAM 5

Pollution

PURPOSE: ***To present to students several considerations in determining the relationship between population, environmental deterioration, and pollution.***

- *An animated Nature Eater illustrates the consequences of the "commons" concept of free goods.*

  Some natural resources, such as air and water, are considered to be held in "common"; they are abundant, and may be used freely by everyone. If we do not use these "commons" wisely, we may be in trouble. Present high levels of consumption, faulty technology in some cases, and increases in population are contributing to the depletion and/or deterioration of these limited "free" resources.

- *A street cleaner ponders the pollution problem in his metropolitan area.*

  Industrial waste and the automobile contribute heavily to air and water pollution, and environmental deterioration. In fact, 42% of our air pollution is caused by transportation, with private automobiles the chief culprit. The internal combustion engine is responsible for most of the carbon monoxide, hydrocarbons, and nitrogen oxides in the air.

- *A public service television announcement illustrates the scope of American pollution problems and gives some of the reasons for it.*

- *Paul Ehrlich and Barry Commoner (see page 22-23) challenging the popular notion that "people start pollution, people can stop it," present their individual views on the relationships between population and pollution.*

- *A silent movie demonstrates America's preference for and use of convenient, nonreturnable, and often nonrecyclable, disposable items.*

  The average American throws away three pounds of solid waste every day. The total amount of solid waste disposed of each year is greater than can be accounted for by the population growth of that same year, indicating greater per capita disposal.

  Each year the solid waste problem becomes greater, partially because of increases in population, but also because we consume more and insist on complex and often wasteful packaging. Thus, the problem is not only population growth, but also increased consumption and dubious technologies.

Paul R. Ehrlich, PhD.
Professor of Biology
Department of Biological Sciences
Stanford University
Palo Alto, California

"When you read in the media or hear it said that people cause pollution and therefore can stop it, in a sense you have a statement that is true and in a sense you have a statement that is very false. The very nature of agricultural man (human beings that no longer hunt and gather food but practice agriculture) means they are going to have a negative impact on the environment; and as long as the population size is too large, the environment will suffer irreversible deterioration. So in that sense, people cause pollution and people can't stop it until there are fewer people. In another sense, however, many of our worst problems in environmental deterioration are due to our patterns of overconsumption, overbreeding, and so on; and people are obviously the only agency which can stop it, since people are the only agency which causes pollution."

Barry Commoner, PhD.
Director, Center for the
Biology of Natural
Systems
Washington University
St. Louis, Missouri

"The question is, which people? Some people cause more pollution than others; some people are responsible for the decisions that cause pollution. And I think the original intent of this kind of propaganda was to say that pollution is everybody's problem and that if we all did our part it would be solved. And the more of us there are, the more pollution there is. Well, I don't think the facts support that kind of conclusion. For example, the reason we have so much smog in our cities is that the American passenger car has been transformed into a smog-generating vehicle. The way it happened is that we have raised the compression ratio in the engine. This makes the engine run hotter; because it runs hotter, the nitrogen and oxygen in the air taken into cylinders reacts chemically, nitrogen oxide is emitted from the exhaust, and that triggers smog. Now we have very sharply increased the compression

ratios of American car engines since World War II and that's what has produced pollution. There are also more cars and more people. But the main effect is the change in the engines. Now whose fault is that? I don't think you can blame it on the person who buys the car, because you buy what Detroit makes. And that responsibility lies with the management of the auto industry."

PAUL EHRLICH:

"There's often a tendency to blame industry for pollution problems; and in a sense they are a great deal of the blame because, in collusion with government officials, they often try to prevent measures to abate pollution and so on. At the same time, it's the people who buy the products of industry and will not vote out dishonest and stupid government officials and so on, who are equally responsible. So, I wouldn't lay disproportionate blame on industry. If we, for instance, wanted to solve the problems caused by the automobile, it could be done by people refusing to buy big wasteful cars. You don't say it has to be done by Detroit automobile makers; they don't buy the cars. So in a sense the real power rests in the hands of the people. They could get industry into shape—if they wanted to vote the right kinds of officials into government, take the right steps in consumption, and so on."

BARRY COMMONER:

"It seems to me that we don't have in the country at this time a political party which is willing to look objectively at our economic system and alter it in ways that make it more sensible with respect to our resources. I think we could use such a political party. It may be a third, fourth, or fifth party; but let's have one . . . I think it's time we debated in this country the rationality of the way in which we produce our goods. That's the cause of most of our pollution problems. And I think we have to get away from slogans like 'private enterprise,' and 'socialism,' and so on, and just ask very simple direct questions, such as 'What is the best way for the people of this country to use the marvelous resources that are at our disposal?' "

PAUL EHRLICH:

"When you ask whether it is better to attack American pollution problems, or as I would prefer to say, problems of environmental deterioration in the United States—because our most serious problem is our attack on the life support systems of the planet which are absolutely essential to our existence—when you ask whether or not this should be through population control or through attacking our level of affluence or the technology used to maintain that affluence, you have to look at all three factors. You come up with a rather complicated answer. In the short term, your most rapid results would come through attacking affluence and technology. For instance, overweight gas-consuming cars are a sign of affluence and we should get rid of them immediately. And we *could* get rid of them immediately and have a very big effect on our environment. Similarly, putting lead in our gasolines is a technological error. We could remove the lead immediately and we would begin to have a *very important* effect on our environment.

"At the same time, if we ignore the population component of the problem, which multiplies with affluence and technology factors to give you the total environmental impact, we will be in deep trouble soon enough—for instance, if we managed to halve our impact by cutting down on our technological mistakes and our affluence and just let our population continue to grow until it has doubled. Of course, when the population has finished doubling, we would be right back where we started. Slowing population growth, stopping it, and eventually reducing the population takes a very long time, and that is the reason we must start on it immediately. It is going to take a long time to affect that component and it is at least as important as the others."

BARRY COMMONER:

"During Earth Week 1970, various people said, 'You know, the problem with pollution is, there are too many people. They're too affluent.' And so I did a kind of experiment in my head. I asked myself in what way I was more affluent now than I was at World War II. I decided that one example of that was the fact that I tend to drink a bottle of beer with dinner every night. So I looked at the beer figures and tried to relate them to population, to affluence, and to pollution. Now the first thing you have to decide is, what do you want out of a bottle of beer. Most people want the beer, not the bottle, and that's important. Because the bottle is the pollutant and the beer is the goods. You then have to ask yourself the question, 'How much beer has been drunk; and how many people have been drinking beer; and what is the relationship between bottles and beer?' Because that's the technological factor. Well, since World War II, population has gone up 45 to 50%. So there's that much more beer drinking due to increased population. The beer drunk per capita has not changed; it's about 26 gallons per year per capita. So that hasn't changed. Then we ask ourselves, 'What's happened to the ratio between bottles and beer?' That's gone up enormously. Around World War II all the bottles were returnable. That means that for every bottle of beer, every drink of beer, we used one fortieth of a beer bottle. Now that we use throw-away bottles, it's become one drink to one bottle. And the result is that the technology of beer sales, so to speak, is the main thing that's given us the clutter of beer bottles. The same argument holds for soda bottles, for cans, for almost anything we look at."

SUGGESTED ACTIVITIES:

Before the Program

1. If desired, have students complete the vocabulary exercise.
2. Have students begin to research and collect data about pollution and environmental deterioration in America. Students should look for causes other than individual pollution in the home. They should be aware of other factors including consumption, packaging, transportation, industrial waste, nonrecyclable materials, and so on. An excellent starting resource has been provided on page 58 of this guide: a bar chart comparing annual growth rates of production or consumption in the United States. You may want to reproduce it for distribution to students. (Instructions for use have been printed on the graph.)
3. Determine the number of students who think that population is the "root cause" of pollution and their reasons for thinking this. Elicit challenges from those who disagree.

After the Program

1. Ask students to purchase an item which they consider excessively packaged and bring it to class. Individuals should then present their item to all the students, pointing out why they think the packaging is wasteful. Submit the following questions for discussion:
   a. How would you improve the packaging so that it isn't a pollutant?
   b. Why do you think the item is packaged this way? Is it largely because of consumer desire and demand?
   c. Upon close inspection of the packaging of your item, how do these factors influence it as a pollutant: population increases, consumer desire and demand, and technology?
2. Divide the class into groups of five and ten individuals. Ask the students in the group of ten to bring a homemade lunch to school (preferably one similar to that purchased at a burger chain), but to pack the food in as many recyclable (rewashable) containers as possible. Ask the group of five students to patronize a local burger chain, purchasing a lunch identical to that brought from home by the other students. Compare the volume of waste materials (disposable items) between the two groups. Determine:
   a. Did the five individuals who patronized the burger chain throw away more trash than the ten who used recyclable packaging?
   b. What does this tell you about numbers of people and pollution?
3. If costs are prohibitive for Activities 1 & 2, you may want to take your students on a field trip to a local grocery or department store to examine the ways America packages its goods. If time permits and costs are not a factor, have lunch at a local burger chain, noting how much paper and plastic is thrown away.
   Determine:
   a. Does America engage in wasteful packaging?
   b. How might this be improved?
4. Compare the use of paper in your school with the school's population over a period of years. Has paper consumption increased faster than school population? Or has it decreased?
5. Brainstorm: The results of the research in Before the Program Activity 2.
6. "Imagine" games:
   a. Imagine a plastic park. Are there any now?
   b. Imagine having to buy bottled water in a grocery store? Are we coming to that?
   c. Imagine a hundred miles of solid concrete? Have we arrived at this?
   d. Imagine everyone using returnable bottles. What would happen?
7. Students should compare their parents' recollections about the use of returnable bottles during their childhood with the use of nonreturnable bottles today.

Program 5

VOCABULARY EXERCISE

Unscramble the population-related words listed below and match them with their correct definition.

VEERINTONMN	LAVEERINTONNM
TOLLUPNOI	RIDETOTERAION
OMMSCNO	DABBLEAGEDOIR
HEYLOGNOTC	NOTINPUCSOM

A. Land and/or resources belonging equally to or shared alike by two or more or all in question.
B. A worsening of the quality and/or conditions of an environment.
C. The sum of the ways in which a social group provides itself with the material objects of civilization.
D. Physical uncleanness or impurity.
E. Something that surrounds.
F. Capable of decaying and being absorbed by the environment.
G. The use of goods, resources, and services.

KEY

ENVIRONMENT (E)	ENVIRONMENTAL DETERIORATION (B)
POLLUTION (D)	BIODEGRADABLE (F)
COMMONS (A)	CONSUMPTION (G)
TECHNOLOGY (C)	

STUDENT MATERIALS

Reproduce and distribute the following narratives to students for comment or criticism.

"Even if population and economic growth were to slow down or cease, we would still be faced with growing environmental and resource problems as a consequence of our own activities, as well as pressures emanating from population growth and struggles for higher standards of living in the rest of the world. More direct attacks on these problems will be required in any case."

Population, Resources and the Environment, Roland G. Ridker, ed., Vol. III of the U.S. Commission on Population Growth and the American Future Research Reports. Washington, D.C.: Government Printing Office, 1972, page 19.

". . . the impact of population on resources and the environment depends on a host of intervening variables, some of which may prove to be more important than population growth, and all of which could change considerably in the next 30 to 50 years."

". . . Each sector of the economy has different resource requirements and emits different types and quantities of wastes. The effect of wastes on the environment depends on the form in which they are emitted. Moreover, the kinds of treatment possible, as well as their costs, vary between sectors and types of pollutants."

". . . All activities involve waste. If these wastes are not emitted into the air, they will show up in liquid or solid forms. If restrictions are placed on the use of the automobile, some other form of transport with its own array of resource requirements and pollutants must be substituted."

". . . Far more important for judging resource adequacy and pollution levels in the future will be changes in our ability to substitute one resource for another; changes in attitudes towards work, leisure, and migration; and a host of international contingencies, all of which have multiple effects. In truth, to say much about the impact of population growth, we really should write a history of the human race during the next quarter-to-half century."

Population, Resources and the Environment, Roland G. Ridker, ed., Vol. III of the U.S. Commission on Population Growth and the American Future Research Reports. Washington, D.C.: Government Printing Office, 1972, page 37.

"If because of personal preferences, we choose to have more rather than less children per family—on the average, say three rather than two—we commit ourselves to a particular package of problems: more rapid depletion of domestic and international resources, greater pressures on the environment, more dependence on continued rapid technological development to solve these problems, fewer social options and perhaps the continued postponement of the resolution of other social problems, including those resulting from past growth. So long as population growth continues, these problems will grow, slowly but irreversibly forcing changes in our current way of life."

Population, Resources and the Environment, Roland G. Ridker, ed., Vol. III of the U.S. Commission on Population Growth and the American Future Research Reports. Washington, D.C.: Government Printing Office, 1972, page 19.

PROGRAM 6

Feeling Crowded?

PURPOSE: To inform students that, while density is a scientific measure, crowding is a feeling and a matter of individual perception.

WHAT STUDENTS WILL SEE AND LEARN:

- *A Dial Soap television commercial followed by a sequence on a city bus illustrate a variety of human reactions to crowding.*

  A crowd is basically any group of people; but crowding is a feeling. While each of us has our own definition of crowding, that definition will vary with time and place, depending upon one's perception of the circumstances.

- *Mini-houses on a map show population density in America today.*

  Population density is a general scientific measure of the number of people in a given area at a given time. If the population of the United States were distributed evenly (which it is not), there would be 58 people on each square mile of land.

  In the continental United States in 1970, the most densely populated state was New Jersey with 953.1 people per square mile. The least densely populated state was Wyoming with 3.4 people per square mile.

  While density provides us with a statistical comparison of total population to land area between countries or regions, these measures may be misleading because the area within a state is not equally usable: mountains, lakes, and deserts are generally considered uninhabitable. Additionally, some land must be set aside for specific purposes such as farmland and highways. Tnus density, as a scientific measure, cannot tell us if people are living close together or far apart, or whether or not they feel crowded.

  Many of the problems in large American cities, such as crime and mental illness, have been attributed to conditions of high density and crowding. Yet the density of the Netherlands is almost 7½ times that of the U.S., and by comparison it has very few social problems.

  While high density and crowding may be contributing factors to social ills, they are not the sole causes; among other factors are social problems and economic and social discrimination.

- *John B. Calhoun of the National Institutes of Health talks about his crowding experiments on mice.*

  Dr. Calhoun conducted several experiments on mice in an attempt to discover the behavioral effects of high density and crowding. His original colony of 2,000 soon became passive and ceased to court and mate. Consequently, with no reproduction of the species, the entire population of mice aged and died. Dr. Calhoun, concluding that the conditions of high density and crowding caused the breakdown of social roles among the mice, attempts to extrapolate his findings to human situations. However, there is disagreement about the applicability of these findings to humans because "animals are not people." We cannot draw a parallel between lower species and humans mainly because humans have the ability to reason and to form institutions for their collective welfare, and also have a greater ability to adapt to situations.

- *Two sisters, forced to share a single room, illustrate crowding as a matter of individual perception; the older sister feels that "two is a crowd," even though she likes to have pajama parties with five or six friends in the same room.*

  Each of us has his or her own requirements for personal space; and because crowding is a feeling, each of us will react differently.

- *An animated story about a city mouse visiting the country and a country mouse visiting the city reinforces the importance of values, showing that crowding is a feeling.*

- *A family of four on their way to a baseball game illustrates how some crowds can be considered "good" and others "bad," depending on one's perception of the circumstances at the time.*

  A crowd filling the highways, busses, and trains on the way to and from a baseball game may be "bad," but that same crowd at the game may be "good."

SUGGESTED ACTIVITIES:

Before the Program

1. If desired, have students complete the vocabulary exercise.
2. Have the class think of a number of cliches about crowding, such as, "Two's company, three is a crowd." Ask students if they feel that cliches

are applicable to them. What values do they each bring to the situation?

3. Class discussion: Would it be fun to go to a sporting event and be the only spectator there?

After the Program

1. Using the following situations, discuss the similarities and differences in student values about crowding.

   How Many Is a Crowd

   a. on a date?
   b. in an ideal family?
   c. in a one-bedroom home?
   d. in a five-bedroom home?
   e. at a basketball game?
   f. in a hallway at school?
   g. in a classroom?
   h. in a doctor's office?
   i. on a bus?
   j. in a friendship group?
   k. when you're all alone?

2. Have one student stand in the middle of a circle of other students. Ask this student if he or she feels crowded. If the student says no, signal the other students to begin moving closer, stopping only when the student in the center shouts "crowded." Write the student's name on the spot where the circle stopped. Repeat the activity with other students.

   Afterward, discuss: Crowding is a feeling.

3. Have students list on the board the largest and smallest crowds they have ever been in or seen, whether they considered this to be "good" or "bad" at the time, and reasons for labelling them as such. Under different circumstances and times, would any of the "bad" crowds be considered "good" and vice versa?

4. Have students interview members of the school athletic teams to find out how they feel about crowds at the game. Do crowds make them play harder? Better? Why? What if the team is losing and the crowd is booing? What effect does this have?

5. Ask a student to give the school cheer. Then have the entire class give it in unison. Were there differences in the feelings between the two cheering situations?

PROGRAM 6

VOCABULARY EXERCISE

Unscramble the population-related words listed below and match them with their correct definition.

WROCD	INCWOGRD
PEPCRITNEO	NETSIDY

A. One's understanding or view of a given situation.
B. Any group of people gathered together.
C. An individual feeling and a matter of perception to a crowd at a given time and place.
D. The number of people in a given area at a given time.

KEY	
CROWD (B)	CROWDING (C)
PERCEPTION (A)	DENSITY (D)

PROGRAM 6
FACTS & FIGURES FOR TEACHERS
POPULATION DENSITY

	LAND AREA IN SQUARE MILES	POPULATION 1970	DENSITY 1960		LAND AREA IN SQUARE MILES	POPULATION 1970	DENSITY 1960
U.S.	3,536,855	57.5	50.6	Mo.	68,995	67.8	62.6
Ala.	50,708	67.9	64.2	Mont.	145,587	4.8	4.6
Alaska	566,432	0.5	0.4	Nebr.	76,483	19.4	18.4
Ariz.	113,417	15.6	11.5	Nev.	109,889	4.4	2.6
Ark.	51,945	37.0	34.2	N.H.	9,027	81.7	67.2
Calif.	156,361	127.6	100.4	N.J.	7,521	953.1	805.5
Colo.	103,766	21.3	16.9	N. Mex.	121,412	8.4	7.8
Conn.	4,862	623.7	520.6	N.Y.	47,831	381.4	350.6
Del.	1,982	276.5	225.2	N.C.	48,798	104.1	93.2
D.C.	61	12,401.8	12,442.3	N. Dak.	69,273	8.9	9.1
Fla.	54,090	125.5	91.5	Ohio	40,975	260.0	236.6
Ga.	58,073	79.0	67.8	Okla.	68,782	37.2	33.8
Hawaii	6,425	119.8	98.5	Oreg.	96,184	21.7	18.4
Idaho	82,677	8.6	8.1	Penna.	44,966	262.3	251.4
Ill.	55,748	199.4	180.4	R.I.	1,049	905.4	819.3
Ind.	36,097	143.9	128.8	S.C.	30,225	85.7	78.7
Iowa	55,941	50.5	49.2	S. Dak.	75,955	8.8	9.0
Kans.	81,787	27.5	26.6	Tenn.	41,328	95.0	86.2
Ky.	39,650	81.2	76.2	Tex.	262,134	42.7	36.4
La.	44,930	81.1	72.2	Utah	82,096	12.9	10.8
Maine	30,920	32.1	31.3	Vt.	9,267	48.0	42.0
Md.	9,891	396.6	313.5	Va.	39,780	116.9	99.5
Mass.	7,826	727.0	657.3	Wash.	66,570	51.2	42.8
Mich.	56,817	156.2	137.6	W. Va.	24,070	72.5	77.2
Minn.	79,289	48.0	43.0	Wis.	54,464	81.1	72.6
Miss.	47,296	46.9	46.0	Wyo.	97,203	3.4	3.4

POPULATION DENSITY

No. of People per Sq. Mi.

Canada	6
United States	58
WORLD	68
China	200
Japan	720
Netherlands	819
Belgium	822

Source: U.S. Bureau of Census, 1970.

"In sum, high population density appears to have a serious inhibiting effect on many animals. It must be noted, however, that the effect of density is not uniform among different species; different species react to density in different ways."

"Population Density and Pathology: What are the Relations for Man?", by Omer R. Galle, Walter R. Gove, and J. Miller McPherson, *SCIENCE* magazine, Vol. 176, April 1972.

PROGRAM 7

Metropolitan Areas

PURPOSE: *To demonstrate to students that many of our urban problems are the result of our failure to plan effectively.*

WHAT STUDENTS WILL SEE AND LEARN:

- *Aunt Samantha roller skates on a map of the United States and explains population distribution.*

  Americans are a metropolitan people. Most families live in a metropolitan area. Most births and deaths take place in them, and most people migrate to them. Almost 75% of the American people live on only 1½% of the land, making the United States a nation of cities, often called megalopolises.

- *A sequence of photographs depicting historic urbanization of the United States is juxtaposed with people offering their opinions on why they prefer city or suburban living.*

  The census of 1920 was the first to show that more people lived in urban than rural areas. In 1970, the census revealed that seven of every ten people in America live in a metropolitan area.

  Natural increase (births-deaths), not migration, is the major cause of American metropolitan growth today.

  The U.S. Bureau of Census estimates that 85% of the population will be living in a metropolitan area by the year 2,000, with the majority living in four "supercities" stretching from Boston to Washington, D.C., Chicago to Pittsburgh, San Francisco to San Diego, and Miami to Tampa.

  Since 1950, large numbers of people have been moving from the central city to the suburbs. From 1960 to 1970, almost half of the fifty largest American cities lost population, mostly to suburban areas.

- *A city planner uses a large model of a metropolitan area to illustrate the consequences of our failure to plan effectively.*

  Mobility (roads and automobiles), the movement of business and industry, and the exodus of the middle class population from the central city are contributing to urban sprawl—expansion which soon takes in outlying villages and towns to accommodate a growing metropolis.

  Possible contributing factors in the decay of our central cities include the following:

  1. The more affluent people have moved to the suburbs leaving behind the poor.
  2. Many businesses and services formerly located in the central city have moved to the suburbs.
  3. Job opportunities have moved to the suburbs.
  4. There is a lack of cooperation and planning between city governments and adjoining suburban governments, resulting in a multiplicity of governments and tax laws, and duplication of municipal services within the metropolitan area. For example, 94 independent suburban communities surround the city of St. Louis (1972 population: 622,236). Each community has its own local government, tax base, fire and police departments, etc. Consequently, there is considerable overlap and duplication of services in the metropolitan area (SMSA 1970 population: 1,740,781).
  5. Failure to plan for anticipated population growth, allowing it to spread at will, results in suburban sprawl.

- *The program closes with an original song, "Bring the City Back to People," calling for efforts to make the city a viable living unit for people once again.*

SUGGESTED ACTIVITIES:

Before the Program

1. If desired, have students complete the vocabulary exercise.
2. Reinforce After the Program Activity 2 (Program 2) on page 8-9 (comparison of large and small populations).
3. Class Project: a scrapbook containing news clippings and advertisements about your own or a nearby metropolitan area. Determine the problems of the area and the current and proposed efforts toward finding solutions. After analyzing the problems, students should attempt to find the causes.

After the Program

- After reading the following statement to students, discuss the question, "Why is it inevitable that population will not be distributed evenly?"

  "The concentration of national population within limited areas appears to be characteristic of practically all developed countries. It has little to do with overall population size or

density—but rather is a reflection of the massive reorientation of population growth and life styles associated with the industrial and technological revolutions of the last two centuries. Enormous change in modes of population settlement, land use, and resource depletion accompany these revolutions."

-The U. S. Commission on Population Growth and the American Future, 1972, page 25.

- Reproduce and distribute maps on Page 60 and 63. Have students compare and discuss them.
- Have the class study the problems of urban decay in America and efforts to reconstruct the central cities. Solicit volunteers to present oral reports with supportive evidence. Use the charts and questions on page 59 to compare urban and rural population growth.
- Brainstorm: Why are some lands better used for one thing than another? Include the idea of uninhabitable lands.
  1. Could people live on mountains, in deserts, on water, etc.?
  2. If so, what resources might have to be brought in or artificially produced to sustain life?
- Reiterate that the earth is finite. Then submit the following questions for discussion:
  1. What would American life be like without the elevator?
  2. What have we done to increase our stock of land? (Build up, not out.)
- Reproduce the lyrics to "Bring the City Back To People." Ask the following questions:
  1. What is the song writer trying to say?
  2. Are the lyrics accurate by today's standards?

BRING THE CITY BACK TO PEOPLE!

Once upon a time, the city was
the place to be.
The pace was fast, the lights
were bright with opportunity.
Growth we saw as progress,
Smokestacks bellowed at the sky.
Jobs attracted people,
Till there was no more room
to fly . . .
Fly a kite.
Or ride a bike.
No clean air left to breathe.
The city grew beyond itself.
And people began to leave.

Only a place to come and go,
It's not the way it should be,
So we must bring the city back
to people . . .
Bring the city back to people . . .
Bring the city back to people . . .
There should be more room to
laugh.
More friendly open doors.
If the city is not for people,
Then who is it for?

The cars pour(ed) in each morning,
And out at five o'clock.
Leaving the poor to walk on
darkened streets
With fear on every block.
The prices are so high these
days,
When spirits are so low.
The glory of our society,
And what have we to show.

Only a place . . . etc.

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- Divide the class into five groups as follows:

  GROUP A: Metroberg, a central city.

  GROUP B: Popover, a surburban community bordering Metroberg on the north.

  GROUP C: Superton, a suburban community bordering Metroberg on the east.

  GROUP D: Freeville, a suburban community bordering Metroberg on the south.

  GROUP E: Subdale, a suburban community bordering Metroberg on the west.

  Together, the five groups make up a metropolitan area, population 1,677,800 and growing at the rate of 1% a year. Each community has its own government and service institutions (e.g., fire, police, sanitation departments); consequently, there is much duplication in the five communities, and to date the five governments cannot agree on much of anything.

  The following problems are to be solved by students:

PROBLEM 1:

Metroberg is losing its upper and middle class population to surrounding communities, with the result that there are many poor people and decaying areas in the city. Most blue-collar jobs have moved to the suburbs while most white-collar jobs are still in the central city. While 80% of the blue collar workers live in the city but must travel to their jobs in the suburbs, 70% of the white collar workers live in the more affluent suburbs but must travel to their jobs in the central city. Although Metroberg and the surrounding communities have a bus system, most people drive to work by private automobile because the transit system is inadequate and ill-financed. Although the fares are high, the service is unreliable and does not reach into all areas of the community, especially in the

suburbs. Consequently, the highways and streets are severely congested during working hours.

A study group has been organized to redesign the public transit system. The two major viewpoints are: the central city wants lower fares (present 50c; proposed, a reduction to 25c); the suburban communities want increased service and more bus routes. They are content to allow the fares to remain at their present levels. The transit company maintains that lack of funds prevents them from doing both. Presently, the company receives most of its financial support from a ½ cent gasoline sales tax in the central city. However, for the past four years, the transit company has been operating at a deficit.

Meanwhile, another group is conducting a feasibility study to build a rapid transit system (subway/monorail) in the metropolitan area. Most indications reveal that although a rapid transit system would be highly beneficial to the area in terms of better service, more routes, and lower fares, it would cost at least $5 billion and take a minimum of six years to complete. Financing such a system, the study group maintains, must involve the entire metropolitan area and be equitable to all.

Discuss: The transit dilemma in Metroberg and ways to solve it, both in the interim and permanently. Don't forget to plan for increases in population.

PROBLEM 2:

Three major cultural attractions—the zoo, art museum, and the symphony—are located within the central city. Residents from the entire metropolitan area use these attractions, but the institutions are financed only by a 2 cent (2%) tax on all retail sales in Metroberg. Suburban residents are not taxed. The three cultural institutions, in deep financial trouble, may have to close. There is talk of charging an entrance fee to the presently free-of-charge zoo and art museum, but a recent newspaper poll taken in the area reveals this to be highly unpopular with the people.

Discuss: Methods to more effectively and equitably finance the zoo, art museum, and symphony.

- Invite a city official to speak to the class about local urban problems and efforts to solve them.

FACTS & FIGURES FOR TEACHERS

1970 SIX U.S. SUPER URBAN AREAS

	SMSA*	CITY
New York	16,178,700	7,894,862
Chicago	7,612,314	3,366,957
Los Angeles	7,032,075	2,816,152
Philadelphia	4,817,914	1,948,609
Detroit	4,199,931	1,511,482
Houston	1,985,931	1,232,802

*Standard Metropolitan Statistical Area: a city of 50,000 inhabitants or more (the 'central city'), or two or three cities with combined population of 50,000 or more, together with the county or counties they are in, plus one or more adjoining counties if their stores, businesses, and other consumer arteries are expansions of those in the central city or its satellite cities.

Source: U.S. BUREAU OF CENSUS, 1970.

"Although the overall figure indicates a small gain in population for central cities (in SMSA's) (3.8 million or 6.4%) between 1960 and 1970, a great many cities actually lost population. Almost half of the 50 largest cities did so, intensifying losses that had occurred in the 1950's.

"One of the steepest declines was experienced by St. Louis with a 17% loss, this on top of a 12.5% loss in the 1950's. Other large cities that had 1960-70 losses of more than 10% include Cleveland, Buffalo, Cincinnati, Minneapolis, and Pittsburgh."

Source: "We the Americans: Our Cities and Suburbs"; U.S. Bureau of Census, 1970.

HOW WE GET TO WORK!

Residents of:

	Central City	Suburbs
Private car	69.1%	84.1%
Bus, streetcar	12.2%	3.4%
Subway, elevated train	6.5%	0.5%
Train	0.4%	1.3%
Taxicab	0.5%	0.3%
Walked	7.9%	5.7%
Worked at Home	1.8%	2.5%
Other means	1.6%	2.2%

Source: U.S. Bureau of Census, 1970.

STUDENT MATERIALS

After reading the paragraph below, research your own town or city to find specific examples of conditions mentioned.

"The process (metropolitan growth) has brought efficiency and confusion, affluence and degradation, individual advancement and alienation. The build-up of transport and communications has made possible increased contact and exchange, increased concentration and dispersal, and increased segregation of activities and people. While the metropolitan economy has reached new heights of productivity, the people who staff it, their families, and the businesses and roads that serve them, have settled miles and miles of formerly rural territory, creating a new enlarged community—a real city with common problems but no common government to manage it. Minority migrants have found better jobs and education; but in so doing have traded the isolation imposed by rural racism for the isolation of the inner city and the institutional racism of metropolitan America. And, the growth and dispersion of the metropolitan population has brought wholly new problems of environmental management as well as social organization."*

*Population and the American Future, The Report of the U.S. Commission on Population Growth and the American Future, 1972, page 25.

PROGRAM 7

VOCABULARY EXERCISE

Unscramble the population-related words listed below and match them with their definition.

BUTTONRIDSI	MTANROPELOI[illegible] AEAR
TRAPOOLIMENT	LOOMPEGSAIL
YCTI	UBREX
BUSRUB	ARBUN
RUZIRNITANAO	

A. A large or important town.
B. Of or pertaining to a metropolitan area.
C. The way in which a population is spread over a given area.
D. To render urban.
E. A small community beyond the suburbs of a city.
F. An urban area consisting of a central city, suburbs, and exurbs that adjoin each other.
G. An urban region consisting of several large cities and suburbs that adjoin each other.
H. Of or pertaining to or comprising a city or town.
I. A district lying immediately outside a city or town.

KEY

DISTRIBUTION C)	METROPOLITAN AREA (F)
METROPOLITAN (B)	MEGALOPOLIS (G)
CITY (A)	EXURB (E)
SUBURB (I)	URBAN (H)
URBANIZATION (D)	

PROGRAM 8

Families and Babies

PURPOSE: *To show students that different-sized families have served different needs in different periods of history.*

WHAT STUDENTS WILL SEE AND LEARN:

- *A reporter goes back in time to interview families in different periods of American history.*

  Fertility (as defined herein) is the number of children born to each woman in her lifetime. Two children per woman is called Replacement Level Fertility; anything above would mean continued population growth and anything below ultimate population decline.

  Over the long term, the fertility rate determines the birth rate; and, since the late 1800's, both have declined.

  In the early 1800's, when infant and child mortality was high, each woman averaged about seven children. America was mostly a rural nation, and large families were needed to work the land. Small families were considered "poor" or "unfortunate."

  By 1900, average fertility had declined to about three children per woman. It was an era of industrialization and migration to the cities. Mechanization of farm equipment, while increasing productivity, decreased the number of workers needed for the job. Simultaneously, the cities industralized, creating new jobs in business and industry, and metropolitan growth began in earnest. People began leaving the farms for the "good life" in the cities. On the average, couples had a higher standard of living and began to realize that they could provide more (education, food, clothing, etc.) if they had fewer children.

  Then in 1929, the economy hit bottom and America found herself in the midst of a depression. Unemployment rose to an all time high and fertility to what was then an all time low --an average of about two children per woman. With jobs and food at a premium, couples could not afford to have large families.

  Following World War II (in the late 1940's and early 1950's), families were reunited, and average fertility rose to almost four children per woman. Many couples who had postponed marriage during the war now married and started new families. This period in history is known as the post-World War II "baby boom."

  In the early 1970's, average fertility declined to about two children per woman, starting a trend that is still with us. It appears that today's young people expect to have far fewer children than their parents. Modern methods of birth control enable couples to plan their families more surely; more women have careers and are postponing childbearing; a higher standard of living prevails; problems threaten our economy: All of these factors contribute to decreased fertility in America today.

- *A television public service announcement points out that, although there can be many pressures and reasons for having a baby, there is only one right reason: wanting the child.*

- *An original song, "Potential Parent," coupled with advertisements from the print media, illustrate pronatalist influences in American society.*

- *Four average American families talk about changing family size and roles.*

  The Family with Thirteen Children: ". . . There is a social responsibility involved in having a family, whether small or large. Trying to raise our children so they will be effective, contributing citizens is certainly uppermost in our minds . . . I think there will always be people who want a large family, and I hope that the time will never come when they won't be able to have as many or as few children as they choose."

  The Childless Couple: ". . . I think there is a very strong social stigma in America against people who don't want to have children. The sort of norm is a family with children, and I feel there is a lot of pressure from parents, peer groups, and friends for a couple to have children in order to conform and go along with everybody else."

  Working Parents with Two Children: ". . . I think we're trying to work toward the fact that there are certain jobs that have to be done to maintain the household and it shouldn't fall on one person or the other . . . We try to work out a relationship where both of us can have freedom to do the things we have to do in order to grow and be separate individuals, but at the same time to maintain a very close family."

  The Traditional Couple with One Child: ". . . We're somewhat traditional in that I work and my wife stays home and takes care of the family. My family was like this: my father worked and

my mother stayed home. And this is the way I think things should be."

- *A photomontage illustrates the new role of women in American society.*

More and more women are choosing roles other than wife and mother. Today, the woman working outside of the home is increasingly becoming the norm rather than the exception. Although the exact reasons are not yet known, working women on the average tend to have fewer children. Also, women who have higher levels of education tend to have fewer children.

Despite the fact that females comprise nearly 40% of the total work force in America, today's working woman is generally in a low-prestige, low-paying job because of sex role stereotyping and even outright discrimination.

One goal of the women's liberation movement is to obtain equal opportunities for females, so both men and women can be free to develop as individuals without being forced into traditional roles dictated by society. For many people, fulfillment does not always involve marriage and childbearing. Neither does a "good" marriage always produce children.

SUGGESTED ACTIVITIES:

Before the Program

1. If desired, have students complete the vocabulary exercise.
2. Reproduce and distribute the survey on page 35 a day or two in advance of the program. This will allow students ample time to give thoughtful answers. See After the Program Activities for teacher instruction on the use of the survey.
3. What are students' attitudes toward the roles of men and women in American society? Discuss.

AFTER THE PROGRAM

1. Discuss the Marriage and Childbearing Survey (pages 35-36).
2. Brainstorm: What is a large family? What is a small family?
3. Have students bring to class examples of pro- or antinatalist advertisements or stories from newspapers and magazines. Discuss how they might influence decisions regarding childbearing.
4. Discuss the following:
   a. Does fulfillment for a woman (or for a man) necessarily involve marriage and childbearing?
   b. Does a "good" marriage always produce children?
   c. Do prevailing social mores in our culture view childless marriages as normal or abnormal?
   d. How do these social mores manifest themselves in everyday life?
5. Have students determine what factors and/or opinions are influencing their decisions to marry and have children, not to marry, or to marry and not have children. Some suggestions: friends, parents, grandparents, radio, television, movies.
6. Reproduce the lyrics of "Potential Parent." Discuss in class:
   a. What is the song trying to say?
   b. Find examples in newspapers and magazines of the things that the song is talking about.
   (This activity can be merged with Activity 3.)

POTENTIAL PARENT

Will you or won't you . . .
Believe what they told you . . .
Children are supposed to guarantee
Proof of your identity.
According to smiling moms and dads
In TV commercials and magazine ads.
But you know it isn't really true.
Pretty pictures are persuading you.
What can a potential parent do?

Don't have more than one or two
ZPG is pressuring you.
Decrease the population will avoid
decay,
Babies take your leisure time away.
Can't afford vacations or an hour to
play.
But you know it isn't really true.
Media's bombarding you . . .
What can a potential parent do?

Don't you wish they'd leave you alone,
Make your decisions on your own
Everybody has a message to sell to you.
Can't avoid it even if you wanted to,
What can a potential parent do?
Be careful how you listen,
'Cause your future is up to you.

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7. Reproduce and distribute the graph on page 61 "Total Fertility Rate." Have the class discuss the fertility rate trend in America since 1800.

Program 8

VOCABULARY EXERCISE

Unscramble the population-related words listed below and match them with their correct definition.

TRIFELTIY	TAROPALNSTI
ITANLISTATAN	ALTAN

A. Pertaining to births.
B. In favor of childbearing.
C. Against childbearing.
D. The number of children born to a woman.

KEY

FERTILITY (D)	PRONATALIST (B)
ANTINATALIST (C)	NATAL (A)

PROGRAM 8: FAMILIES & BABIES

Before the Program Activity 2

After the Program Activity 1

INSTRUCTIONS

In tabulating the results, look for the following patterns: Most persons will probably indicate plans for marriage and childbearing that are quite similar —revealing conditioning by cultural and social forces. Note those who do not expect the female to work after marriage: are there differences in male and female responses? Do the answers to the questions on number of children expected and number desired differ? If the same, mention the Commission's finding that 44 percent of all births from 1966 to 1970 were reported as unplanned and 15 percent as unwanted.

The questions on attitudes may suggest biases against nonmarriage and childless marriages as well as expectations that women will fit into the role of wife-homemaker-mother. Look for answers to question 15. If in agreement, the class does not reflect the Commission's recommendation for less regimented reproductive behavior. Such a recommendation was based on evidence that a nongrowing population could be reached if, *on the average*, families had about two children. This is not recommended as a standard for all to achieve.

In light of the results of the survey and after participants have had a chance to analyze and discuss their own attitudes, offer the following statement from the Commission for further comparison:

> *The objective for American society should be to make the childbearing decision as free as possible of unintended societal pressures: It should not be to "force" people to become parents in order to seem "normal," but to recognize that some people, and perhaps many, are not really suited to parenthood. We should strive for the ideal of diversity in which it would be equally honorable to marry or not, to be childless or not, to have one child or two or, for that matter, more. Our goal is one of less regimentation, not more.**

*Reprinted with permission from The Population Reference Bureau, OPTIONS, A Study Guide to Population and the American Future, 1973.

SURVEY: MARRIAGE AND CHILDBEARING

1. Female_____ Male_____
2. Do you plan to marry? Yes_____ No_____
3. If yes, at what age do you plan to marry? Age_____
4. If female and you plan to marry, do you plan to work after marriage? Yes_____ No_____
5. If male and you plan to marry, would you like your wife to work after marriage? Yes_____ No_____
6. If female how long will you work?
   If male, how long should your wife work after marriage? Years_____
7. If you plan to have children, at what age would you expect to have your first child? Age_____
8. How many children do you want to have? No._____
9. How many children do you *expect* to have? No._____
10. At what age would you expect to complete your childbearing? Age_____

Do you agree or disagree with the following statements:

	Agree	Disagree
11. Part of the fulfillment of everyone's life is in marriage.	_____	_____
12. Part of the fulfillment of everyone's life is having children.	_____	_____
13. A childless or a single-child family may have as fulfilling experiences as other families.	_____	_____
14. If a couple has the number of children they want, but all are of one sex, they should keep trying for a baby of the other sex.	_____	_____

15. All American couples should have two children in the interests of stopping population growth. _____ _____

16. Woman's place is in the home. _____ _____

17. After marriage and childbearing, women should continue working. _____ _____

18. Because most women marry and leave work when children are born, minor forms of job and pay discrimination must be expected. _____ _____

19. Unmarried women who are in their 40's and 50's are lonelier than unmarried men of the same age. _____ _____

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PROGRAM 9

Zero Growth

PURPOSE: ***To inform students about population stabilization and the possible consequences on American life.***

Before Beginning: A Reminder to Teachers

When discussing the 0-, 1-, 2-, and 3-child family size, inform students that you are speaking of an *average* family size for the total U. S. population. This means that some people will have many children, some only one, others none. It is the *average* of the total family size that counts.

WHAT STUDENTS WILL SEE AND LEARN:

- *A mime imagines the world as a balloon.*

  The earth is finite, and infinite population growth on a finite world is impossible because there are physical and biological limits. Therefore, everyone basically agrees that a zero rate of growth is inevitable, ultimately. The question is when and how to achieve it, and the advantages and disadvantages of the different means.

- *Atop Mount Olympus, Zeus questions his loyal prophet about the pathways to zero growth.*

  Zero growth, or population stabilization, means that the number of births each year equals the number of deaths each year, assuming no migration.

  If women stopped having children and continued not to have any at all, the human race would become extinct in a century or less.

  If American women start and continue to average only one child, the population of the United States will stop growing immediately (assuming no migration), but there would be serious disruptive effects on the economy and society. Such continued low fertility would eventually lead to a decline in the population.

  If American women start and continue to average about two children, the population of the United States will stabilize in about 70 years (again assuming no migration). Although two children per woman is replacement fertility, the momentum built up by our past growth would keep the population growing for about 70 more years.

  If American women start and continue to average three children, the population of the United States will continue growing and never stabilize.

  The two-child average per woman appears to be the most practical path to stabilization because the length of time required to reach zero growth would allow society to gradually adjust to the changes.

  Zero growth would afford us time to work on improving the quality of life rather than concentrating only on supplying a growing population with the necessary goods and services. Zero growth, however, is not in itself a solution to all our problems.

- *Two young people in various locations suggest some possible consequences of zero growth on American life.*

  Zero growth may:

  (a) Allow us to reduce environmental deterioration if at the same time we curb our use of natural resources, decrease consumption, and improve technology.

  (b) Mean a lower student-teacher ratio in our schools if budgetary allocations remain the same.

  (c) Allow us to concentrate on rebuilding outdated school facilities, apartments, and homes instead of building additional ones, if outlays remain at roughly the same levels as today.

  (d) Provide Americans with a higher average income although disparities will still exist unless efforts are made to deal with the problems.

  (e) Bring about a demand for different kinds of products because of a change in the age structure, the population going from an average age of 29 to 37 years.

  (f) Create a need for more and specialized health facilities and recreational areas, because there will be as many people over 65 as under 15 years of age.

- *Paul Ehrlich and Barry Commoner express their views on zero growth:*

  Paul Ehrlich: "It is absolutely essential that we reach ZPG in the United States, stop our population growth and then start reducing our population over the long term. We have to do that for our own good as well as the good of the

world because of the way we consume the world's resources and the enormous impact the United States has on the environment of the world."

Barry Commoner: "Some people think it's important to achieve ZPG in the United States now. I don't. Certainly, the country can support quite an increase in the population, physically. It will change the social ambience, but that's up to the people to decide . . . Certainly, I believe, not as a scientist but simply personally, that all persons ought to have the right to have as many or as few children as they want."

- *The mime closes the program pointing out that zero growth is a decision that Americans themselves will have to make eventually—whether or not they want it, and if they do, how quickly they want to achieve it.*

SUGGESTED ACTIVITIES:

Before the Program

1. If desired, have students complete the vocabulary exercise.
2. Review the age distribution pyramid (page 57) and concept of momentum as presented in Activities 3, 4, and 5, Program 3, pages 13 and 14.
3. Have students list what what they consider to be problems in America today. After the program, students should discuss how a slower rate of population growth might provide us with an opportunity to solve these problems.

After the Program

1. Brainstorm: Assuming the U.S. can reach zero growth by the year 2000, in what ways might our society and life styles be different? Some hints: employment, services, goods, doctors, teachers, culture.
2. With zero growth, the average age of the population will be considerably higher (37 years old, as compared with the present 29) and there will be as many old people as young people. How might this fact influence your career choice and your chances for advancement?
3. Discuss: By promoting and eventually achieving a zero rate of population growth, wouldn't our country be denying itself many useful, intelligent citizens who might be able to help find a solution for environmental and other problems? Isn't zero growth actually an "anti-life" policy?
4. Debate the Ehrlich and Commoner points-of-view.
5. Aid students in conceptualizing the numbers difference between the two-child average per woman and the three-child average per woman, using the graph and related questions on page 62.

PROGRAM 9

VOCABULARY EXERCISE

Unscramble the population-related words listed below and match them with their correct definition.

TINEFINI	NIETIF
ROZE WRHOGT	BELSAT
TRIFELTIY	RECEMENTLAP
GZP	

A. Abbreviation for zero population growth.
B. Having no limits or boundaries.
C. A population whose rate of growth or decline is constant, and in which the birth rate, death rate, and age-sex structure are also constant.
D. A fertility level where each woman has only an average of about two children.
E. Having limits or boundaries.
F. The number of children born to women.
G. The number of births per year equals the number of deaths per year.

KEY

INFINITE (B)	FINITE (E)
ZERO GROWTH (G)	STABLE (C)
FERTILITY (F)	REPLACEMENT (D)
ZPG (A)	

PROGRAM 10

Attitudes

PURPOSE: *To demonstrate to students that different attitudes toward population issues exist.*

WHAT STUDENTS WILL SEE AND LEARN:

• *Two youngsters visit a local museum which is featuring an exhibit on U.S. population. Inside, people are expressing their attitudes toward population issues.*

Almost everyone has his or her own personal opinion about population issues. There are also group opinions among various population segments, although there is much dissent within these groups.

THE CHARACTERS	*ATTITUDE EXPRESSED*
The Real Estate Developer	He thinks that population growth is healthy for the economy, as exemplified by suburban sprawl. He expresses the "progress is growth and growth is progress" ethic.
The Young Black Male	He is mistrustful of whites and sees population control as a guise to reduce the black population (genocide). He proposes a strong black nation that recognizes its own identity and values.
The Black Mother	She argues against increasing population, largely because of the cost of raising a child. She favors more family planning services.
The Black Father	Also anti-quantity, he expresses the quality issue: education, jobs, and strong governmental representation will bring about change.
The Young Black Female	She sees governmental family planning clinics and birth control programs as being aimed mostly toward blacks and expresses the view that she is against any kind of governmental action whatsoever. She is concerned more with the adoption, health, and living conditions of black people today.
The White Middle-Class Man	He suggests that poor people and black people are having most of the babies in America today, thereby contributing more to our population growth than any other group. However, the black mother points out that 70% of the annual rate of natural increase is attributable to white middle-class Americans.
The Mother of a Large Family	While she and her husband are concerned about population growth, they always wanted and planned a large family from the beginning of their marriage. She then reinforces the fact that it is an average of about two children per woman that is needed for eventual stabilization. (See Program 9.)
The Family Planner	Her belief is that each child should be planned and loved. She explains that most religious groups in America see the primary duty of marriage as being, more or less, for the bearing of children. However, various religions deal with the matter of birth control differently.
The Spanish-Speaking Husband	Unconcerned about population, advocates instead family centrality and "machismo" (the belief that the male is stronger, more reliable, and more intelligent than the female). He brings up the Catholic Church's position on birth control.
The Spanish-Speaking Wife	She favors birth control because it gives women the opportunity for roles other than wife and mother.
The Elderly Man	He maintains that the present population size should be drastically reduced because more people mean more consumption and pollution, thereby further jeopardizing the environment and depleting our limited supply of natural resources.

The Elderly Woman	She expressed the view that the problem is not necessarily the number of people, but the distribution. The tendency of Americans to cluster in small living areas is creating social, urban, and environmental problems.
The Janitor	He advocates limiting immigration because it accounts for nearly 1/5th (20%) of America's annual population growth.

SUGGESTED ACTIVITIES:

Before the Program

1. If desired, have students complete the vocabulary exercise.
2. Reinforce the importance of values.
3. Have students discuss their own attitudes toward population issues.

After the Program

1. Students should again examine and discuss their own attitudes toward population issues.
2. The attitudes presented in the program cannot represent the entire range of opinions. Indeed they barely indicate the diversity within various groups. Through news, media, and interviews (with parents, relatives, friends, teachers, etc.), students should seek stories and viewpoints illustrating the diverse attitudes about population growth in this country. Begin by reproducing the articles on this page for distribution to students.
3. Role-play: Attitudes presented in the program with students frequently reversing roles to get an idea of the diversity of viewpoints. Are any of the characters in the program "stereotypes"?

ABOUT SPANISH AMERICANS

"In general, Spanish-Americans seem much less concerned about 'overpopulation' than the groups mentioned earlier. (e.g., conservationists, zero population growth, etc.). For many, the problem of survival is so pressing that there is little time or energy available for thinking about more remote questions. . . .

"Probably the only sense in which substantial numbers of Spanish-Americans would feel that population is a problem is at the level of their own family. Numerous studies in the United States and in Puerto Rico have shown that ideal family size among Spanish-Americans is frequently below actual size. . . .

Warwick, Donald F. and Williamson, Nancy, "Population Policy and Spanish-Speaking Americans," Documentary Studies prepared for the Population Task Force of the Institute for Society, Ethics and the Life Sciences, August 1971, p. H-16.

FEMINISTS

"We who are feminists are wary of population policy developed by this commission and this country that represents further control by a male-dominated and male-oriented society over female reproduction and life styles."

Testimony of Wilma Scott, NOW Board Chairwoman, before the U.S. Commission on Population Growth.

RELIGIOUS ATTITUDES

"Religious leaders of every persuasion generally agree that the government has some legitimate role in policies that directly affect fertility behavior. Regarding the nature and extent of such governmental intervention, there is considerable disagreement.

"There is a strong consensus, embracing all the major religious groups, in favor of individual freedom of choice in procreative matters. While there is disagreement as to which methods for limiting or spacing children are morally acceptable, there is general agreement that couples ought to be free to choose the number of children they will have."

Dyck, Arthur J. "Religious Views and United States Population Policy," Documentary Studies prepared for the Population Task Force of the Institute of Society, Ethics and the Life Sciences, August 1971, pp. J/72-J/73.

4. Briefly outline the next program, "Population Policy." As students begin to realize the importance of attitudes in the development of policies, call attention to their own opinions and values expressed in the Values Inventory prior to Program 1.
5. Reproduce the article below, "The Genocide Issue: Two Views." Discuss these divergent views.

THE GENOCIDE ISSUE: TWO VIEWS[1]

1. *Dr. Charles V. Willie, Chairman, Department of Sociology, Syracuse University.*

"I must state categorically that many people in the black community are deeply suspicious of any family planning program initiated by whites. You probably have heard about, but not taken seriously, the call by some male-dominated black militant groups for females to eschew the

1 Reprinted with permission from *The World Population Dilemma*, Population Reference Bureau, Washington, D.C.

use of contraceptives because they are pushed in the black community as a 'method of exterminating black people.' While black females often take a different view about contraceptives than their male militant companions, they, too, are concerned about the possibility of black genocide in America.

"The genocidal charge is neither 'absurd' nor 'hollow' as some whites have contended. Neither is it limited to residents of the ghetto, whether they be low-income black militants or middle-aged black moderates. Indeed, my studies of black students at white colleges indicate that young educated blacks fear black genocide. . . .

"I designate the death of Martin Luther King, Jr., as the beginning of this serious concern among blacks about the possibility of genocide in America. There were lynchings, murders, and manslaughters in the past. But the assassination of Dr. King was too much. In Dr. King, many blacks believed they had presented their best. He was scorned, spat upon, and slain. If America could not accept Dr. King, then many felt that no black person in America was safe. For no other could match the magnificent qualities of this great man. Yet they were not enough, and so he was cut down by the bullet of a white assassin in a crime that remains mysterious, considering the help that the assassin received in escaping to a foreign land. . . .

"Let me explain why blacks believe any national program for family stability which focuses upon family planning is a desperation move on the part of whites to remain in control. Whites were not concerned about the family structure of blacks a century and a half ago. Then, blacks were nearly one-fifth (18.4%) of the total population. This, of course, was during the age of slavery, during the 1820's. Then blacks were not free. They were no challenge to whites. Although they represented one out of every five persons in the United States, and although the family assumed even more functions for the growth, development, and well-being of individuals then than it probably does today, American whites were not concerned about the fertility or stability of the black family . . . . Neither the size of the black population nor their circumstances of family life worried white Americans before black people were free.

"But come the mid 1960's, when the throttle to the Freedom Movement was open and demonstrations for self-determination were going full blast, white Americans became concerned about the size and the stability of the black family. Daniel Patrick Moynahan tipped off blacks about what was in the minds of whites when he described the situation as 'acute' because of the 'extraordinary rise in Negro population.' The size and stability of the black family was of no concern to white Americans when black people were enslaved. The size and stability of the black family is a cause for alarm among white Americans, requiring a national program of family control, now that black people are beginning to achieve freedom and equality.

"Blacks, of course, would not claim that there has been an extraordinary rise in the Negro population. The black population in America has increased from 9.9 percent in 1920 to approximately 11.1 percent today—no cause for alarm. But then, maybe an increase of between one and two percentage points of the total population is an extraordinary rise if one believes it is."

2. *Dr. Louis Hellman, Deputy Assistant Secretary for Health (Population Affairs), Department of Health, Education, and Welfare.*

"Family planning services, financed by the government, have not been motivated by any desire to reduce the proportionate share of blacks or any other minority in the population, and the charge of genocide is a complete misunderstanding of what the program is all about. As a matter of fact, family planning has the potential of strengthening the absolute and relative power —economic, social, and political—of minority groups if properly understood and used.

"Voluntary family planning which enables parents to limit the number of children they have to the number they want and can support has been one of the keys to the improved status of people of all ethnic backgrounds. For example, nonwhites in the higher-income groups. It seems very clear that one reason they are in the upper-income group is that they did limit their family size. This enables them to spend more money on their own and their children's education, to live in better homes, to buy better clothes, and to do the things which most people with very large families simply cannot afford to do. Family planning can be, therefore, a means of getting out of poverty or low-income status to a higher-income status.

"There is little doubt in my mind that any minority group which makes intelligent use of family planning—not to reduce their average family size below that of the majority group, but to elevate their economic status—can thereby become a much more influential minority group than it otherwise would be.

"To deny any minority group the right of controlling their fertility while extending this right to the socially and economically privileged would be clearly discriminatory. Neither the majority nor the minority has the right to deny to any member of such minority the same basic rights to control fertility which are accorded to the members of the majority."

PROGRAM 10

VOCABULARY EXERCISE

Unscramble the population related words listed below and match them with their correct definition.

UTDETIAT COGENIDE
THRIB NOTROCL EATCROPORIN

A. The act of producing offspring.
B. Manner, disposition, feeling, position, etc., with regard to a person or thing.
C. The practice of limiting or spacing the number of births.
D. The deliberate and systematic extermination of a national or racial group.

KEY	
ATTITUDE (B)	GENOCIDE (D)
BIRTH CONTROL (C)	PROCREATION (A)

PROGRAM 11

Population Policy

PURPOSE: ***To inform students that policies should be developed to guide population change for the benefit of all.***

WHAT STUDENTS WILL SEE AND LEARN:

- *Two composers attempt to write a musical about population policies.*

  The United States needs a number of coordinated policies to guide population change. According to the U.S. Commission on Population Growth and the American Future, four facts clearly stand out:
  a) The effects of our past rapid growth are going to be with us for a long time.
  b) We have to make a choice about our future growth.
  c) The choice involves nothing less than the quality of life.
  d) Slower population growth provides opportunities to improve the quality of life, but special efforts in other areas are required if the opportunities are to be used well. A slower rate of population growth probably would provide us with the opportunity to develop a series of coordinated policies and find long range solutions to many of our problems.

- *As part of the musical, the two composers write an original song, "Hello America."*

  With the exception of immigration policies, which originally were not developed for reasons of population growth but for population composition (to keep out certain types of people and allow others in), the United States as a whole has no formal written policies to guide population change.

- *Senator J. Phineas Loudbuster delivers a major television address.*

  Many of our social, economic and political policies have unintentional consequences on where and how people live. For example:
  a) Limited production of certain food products lures people from farms to cities.
  b) Government contracts to industry encourages migration.
  c) Urban renewal projects may attract and hold people who can't afford to live elsewhere.
  d) Freedom of movement via automobiles and highways adds to congestion and pollution, and sometimes leads to urban/suburban sprawl.

- *A letter carrier calls for a policy about population distribution.*

  Our extravagant use of land, lack of planning and coordination, multiplicity of governments, and the duplication of services between cities and suburbs reflect a need for a policy on population distribution.

- *A construction worker calls for a policy on international migration.*

  We must address ourselves to international migration, particularly if we are trying to slow down or stabilize the population. Immigration accounted for about one out of five people added to our population between 1960-1970. But because we are dealing with people, any policy on immigration has serious moral, social, economic, and political implications.

- *A stock broker calls for a policy aimed at curbing pollution and environmental deterioration.*

  Reducing the population will not eliminate pollution. Policies are needed regarding industrial production standards, waste disposal, automobiles, and so on. People will have to change their style of living, perhaps using mass transit rather than individual cars.

- *An average American citizen notes that slowing down the growth rate would provide the opportunity to work on solutions to many problems.*

- *The two composers reflect on the complexity of developing specific policies.*

  Americans have many different interests and, although a single set of coordinated policies may not satisfy everyone, attempts must be made to take into account the wide range of concerns.

- *Captain Policy and his sidekick Maynard discover there are two major positions on ways of dealing with population change.*

  1. *Voluntary Measures:* People are free to make their own choices without governmental interference. Some examples of voluntary measures are:
     —Increase education for parents and children, particularly about population change and family planning.
     —Provide free and easy access to family planning services and contraceptives.
     —Provide women with opportunities for roles other than wife and mother.
     —Teach couples the advantages and disadvantages of different size families.

2. *Coercive Measures:* Population change should be regulated by forcing change (passing laws and using other restrictive measures). Some examples of coercion are:
   —Require a couple to buy a license to have a baby.
   —Raise the legal age for marriage.
   —Charge tuition for public schools.
   —Male sterilization compulsory after the second child is born.

Fertility control and limiting births is but one part of guiding population change. We must also consider:

Standards for technology
Distribution of the population
Immigration
Environmental deterioration
Education, specifically population education
Human reproduction
Child care
Adoption
Use of land and natural resources
Migration (internal and external)
Accurate population statistics.

A gradual approach to implementing such policies seems to have inherent advantages because it would not cause any sudden changes in our life style.

- *The two composers reflect on the idea of using time wisely.*

  Presently, America is free to make a choice about its future population growth. Someday we may have no choice, but be forced to change.

SUGGESTED ACTIVITIES:

Before the Program

1. If desired, have students complete the vocabulary exercise.
2. Define the word "policy" for students. Have them draft a few simple policies geared to the immediate classroom.
   Examples:
   a) A policy designed to restrict the population of the classroom to its present size.
   b) A policy designed to curb the use of class resources (paper, pencils, etc.).
   c) A policy designed to conserve energy in the classroom.
   d) A policy that would more equitably redistribute the population of the classroom.
3. Have students review the policy recommendations compiled by the U.S. Commission on Population Growth and the American Future.

After the Program

1. Brainstorm: How does a highway affect the distribution of the U.S. population in comparison with the presence or absence of mass transit?
2. Have students expand the list of unintended consequences of existing economic, political, and social policies and/or practices.
   Some hints:
   a) Wage and price controls
   b) Import and export quotas on raw materials and manufactured products
   c) Raising or lowering of the prime interest rate
   d) City zoning laws and building codes
   e) Automobile emission standards
   f) Failure to adequately finance a mass transportation system over a long period of time, resulting in its deterioration or obsolescence
   h) Highway construction
   i) Quick development of industry in response to government contracts.
3. Have the class compare and discuss the following two statements.

> "Give me your tired, your poor,
> Your huddled masses yearning to breathe free,
> The wretched refuse of your teeming shore,
> Send these, the homeless, tempest-tossed to me:
> I lift my lamp beside the golden door."
>
> Excerpts from *The New Colossus* by Emma Lazarus, engraved on a tablet at the base of the Statue of Liberty.

> "At this moment, the choice seems to be this: When the year 2000 arrives, do we want 250 million people (without immigration) or 266 million (with it)? If stabilization becomes a reality around the year 2040 (because of all the young people now in the population, it will take that long to stop growing even with 2.1 births), would we want 276 million people (without immigration) or 300 million (with it, and at a fertility rate *below* replacement)? Or, if fertility continued at replacement and current immigration continued, our population then would be 315 million and still growing.
>
> "What we must ask is whether our natural compassion for uniting families, the wish to offer a haven for refugees and the nostalgia for our melting-pot heritage justify adding 8% more people to our country. Whether it is worth having smaller families ourselves and reaching the point of no-more-growth at a later date."
>
> Westoff, Leslie Aldridge, "Should We Pull Up the Gangplank?", *The New York Times Magazine*, Sept. 16, 1973.

4. Reproduce and distribute the discussion on page 45, "Adoption of State Population Policy." Also, reproduce and distribute the graph, "Fluctuations in California's Growth Rate," page 47. Divide students, after they have studied the material, into teams for the purpose of drafting sample U.S. population policies. The California model offers relevant material applicable to the entire country. Reinforce the importance of "values" prior to the writing assignment.

Policies written by the students should consider:

a) Growth
b) Distribution
c) Migration
d) Age structure as population phenomenon
e) Family planning and beyond family planning measures

Reproduce the article by Bernard Berelson on page 46 and distribute to students.

After students have written their policies, have them submit selected drafts to the class for a discussion. Determine strengths and weaknesses of each policy and its applicability to various segments of the population as well as to the total.

Compare these policies with those recommended by the U.S. Commission on Population Growth and the American Future.

After the Program Activity

I. Discussion:

ADOPTION OF STATE POPULATION POLICY*

Formulation of population policy by state government will not be a simple task. First, population policy is not an end in itself; it is meaningful only as a way of achieving explicit social, economic, and environmental goals. Unfortunately, California has no deliberate or officially accepted policy objectives relating to fundamental aspects of growth such as urban expansion, resource allocation or population dispersion. Secondly, there are no precedents in the United States to guide state decision makers. As the interim report of the National Commission on Population Growth and the American Future points out, "Despite the pervasive impact of population growth on every facet of American life, the United States has never developed a deliberate policy on the subject." A further complication results from the fact that major forces shaping statewide population growth and distribution—economic expansion, migration, and family size—are dependent on decisions of private individuals and those of the federal government. Traditionally, such concerns have not been the subject of direct intervention by state government.

The failure of state government to take action constitutes, in itself, a population policy. It commits the state to accepting present growth trends as the basis for determining future requirements for public facilities and services and for making a wide range of other vital decisions. Further, because this course is not founded on any conscious attempt to measure the total costs of growth and to evaluate alternatives, the state is forced to react to crises as the problems of growth become apparent and accelerate.

The acute situation in health care, welfare and education in California, while not entirely attributable to population growth, is seriously worsened by a lack of specific population objectives.

California Population Problems and State Policy, A Report to the Assembly General Research Committee, California Legislature, Dec. 1971, p. 4.

Since 1860, despite periodic dips, the state's population has either doubled or almost doubled in every twenty-year period. Therefore, it is possible that California's population could grow to 40 million by 1990. We have to have explicit public policies or programs which might inhibit this increase, nor do we comprehend its implications. At the moment we are taking refuge in the fact that there is a lull in growth due to lessened migration and reduced natural increases—both of which have fluctuated sharply in the past. (See Table 2.) Assuming that the state's long-run growth trend is maintained, how will it translate into education, health and welfare costs, new roads, housing, power installations, and other public facilities? How will we dispose of the wastes of twice the number of our present population? How many new jobs will be required and how much new tax revenue will be generated to meet increased costs of growth? Most important of all, what kind of California will we have if this prediction becomes reality? What will life be like in our cities? How much of our coastline will be undeveloped and accessible to the public; how crowded will our parks and wilderness areas be? We do not have answers, and unfortunately, questions are not being posed in these terms. Our public planning policies and programs have been simply an accommodation to what seems inevitable and these policies promise only "more of the same."

Population changes are not uncontrollable. They are the product of human decisions, and those decisions can be influenced by altering the circumstances and incentives that govern them. Moreover, the public opinion survey referred to previously indicates that a growing part of California's population is looking to government to institute curbs on population growth. Over 70% of the respondents considered action by state government to be desirable and necessary to alleviate problems caused by population growth and distribution.

State government, through its direct programs and actions, plays a large role in influencing the magnitude and character of California's population growth. The delivery of water to Southern California through the construction of the massive state water project has profoundly shaped the growth of that region. By constructing the most extensive freeway-expressway system in the nation, California has spawned the low-density, suburban pattern of development which characterizes the state's metropolitan areas. While probably of little significance in directly influencing fertility, policies of state government, such as those governing taxation and marriage, nevertheless serve to enunciate the social desirability of large families. There is, in addition, the persistent belief pervading state policy and programs that continued population growth and economic expansion are necessary to ensure stability and a continuing source of revenue for governmental services.

The formulation of state population policy will call for a major commitment on the part of state leaders. Conflicts between short-term gains and the

achievement of long-term objectives will require patient and thoughtful resolution. Public understanding and support will also be essential. If such efforts are not successful, pressure may mount to transfer to individual families a greater portion of the cost of facilities and services which are now borne by the public at large. We may also expect increased regulatory measures resulting from competition for resources, space, recreation, transportation, housing, educational facilities, and privacy.

Hopefully, an informed public will accept personal responsibility for bringing population growth in balance with the physical and economic resources of the state. However, a number of state actions can assist in stimulating such attitudes.

Recommendations:

It is recommended that:

State government formulate and adopt explicit population growth and distribution policy aimed at achieving desirable long-term social, economic, and environmental goals for California.

Coordination of the development and implementation of state population policy be carried out at the highest level in state government, desirably as part of the central planning function within the Governor's office.

The Legislature establish a Joint Committee on California's Population to provide legislative oversight in the formulation and adoption of state population policy.

As part of a coordinated planning effort, all major units of state government, including those concerned with transportation, resources, housing, employment, welfare, and education, be directed to measure: 1) the foreseeable impact of present population trends on the functions under their jurisdiction; and 2) the manner in which their functions influence population trends.

As a basis for evaluation and adoption of official state population policy, the Governor ensure that the legislature and the public are informed of the costs and benefits—social, economic, and environmental—of alternative rates of population growth and patterns of distribution for California.

Through its congressional delegation and other appropriate means, state government vigorously seek to influence federal policies, programs, and action which will advance state population objectives.

BEYOND FAMILY PLANNING

by Bernard Berelson

". . . How much in ethical values should a society be willing to forego for the solution of a great social problem? Suppose a program for population control resulted in many more abortions in a society where abortion is not only morally repugnant but also widely unavailable by acceptable medical standards: how much fertility decline would be 'worth' the result? What of infanticide under the *same conditions? How many innocent or unknowing* men may be vasectomized for a fee (for themselves or the finders) before the practice calls for a moral restraint? How large an increase in the regulatory bureaucracy, or in systematic corruption through incentives, or in differential effect by social class to the disadvantage of the poor, is worth how much decrease in the birth rate? How much association of childbearing with monetary incentive is warranted before 'bribing people not to have children' becomes contaminating, with adverse long-run effects on parental responsibility? How much 'immorality' locally defined as extramarital sex, is worth importing along with how much contraceptive practice (assuming the association)? How much withholding of food aid is ethical, judged against how much performance in fertility decline? If it were possible to legislate a later age of marriage, would it be right to do so in a society in which young women have nothing else to do, and against their will? In countries like our own, where urbanization is a serious population problem, is it right to tell people where to live, or to impose heavy economic constraints that in effect 'force' the desired migration? Is it right to withdraw educational benefits from the children in 'too large' families?—which is not only repressive from the standpoint of free education but in the long run would be unfortunate from the standpoint of fertility control. In the balance—and this is a question of great but neglected importance—what weight should be given to the opportunities of the next generation as against the ignorance, the prejudices, or the preferences of the present one? . . ."

*"Beyond Family Planning" by Bernard Berelson, *Studies in Family Planning*, Number 38, February 1969. Reprinted with permission of The Population Council, N.Y., N.Y.

PROGRAM 11

VOCABULARY EXERCISE

Unscramble the population-related words listed below and match them with the correct definition.

CYILOP	UNTOLAVRY
INCECOOR	TRAPECCNOSVEIT

A. Done, made, brought about, etc., of one's own accord or by free choice.

B. Artificial or chemical devices used to control conception.

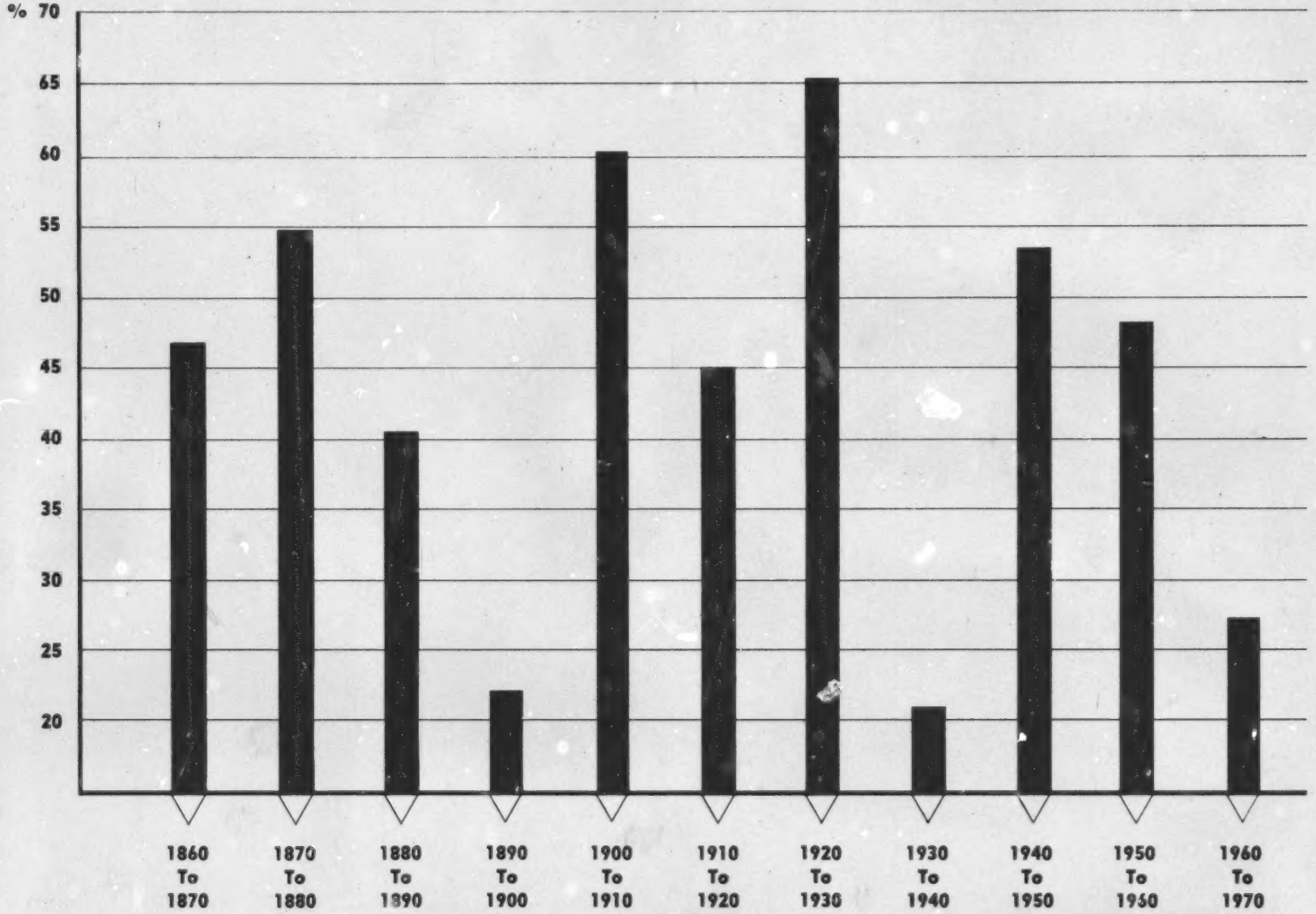
C. A definite course of action adopted and pursued to a given end by a government, ruler, country, etc.

D. The act of compelling by force, intimidation, or authority without regard for individual desire or volition.

KEY	
POLICY (C)	VOLUNTARY (A)
COERCION (D)	CONTRACEPTIVES (B)

FLUCTUATIONS IN CALIFORNIA'S GROWTH RATE

PERCENT GROWTH PER DECADE 1860-1970



Source: California Department of Finance, Population Research Unit.

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PROGRAM 12

Alternative Futures

Purpose: To inform students that the time for long-range planning is now, because the future is now.

WHAT STUDENTS WILL SEE AND LEARN:

- *Ocarina Olivia Optima returns to Earth via spaceship to study our future. A computer summarizes data from previous programs.*

  World Population 1973: 3.8 billion people. In the early 1970's world population was growing at the rate of 2% a year. Assuming this growth rate continues, world population will double in approximately thirty-five years. Some people see this as a cause for alarm, and are quick to judge that we are in danger of breeding ourselves out of existence: that we are "overpopulated." However, we must remember that predictions about the future are risky because they are based on assumptions about future trends. Furthermore, the word "overpopulation" has no inherent meaning. Each person, depending on his or her values, would probably define the word differently.

  "Overpopulation" assumes that there is a single optimum level of population and that the Earth's carrying capacity is known. At present, we do not have conclusive knowledge about either. Also there is no *single* optimum level of population, but many optimums. Each must consider individual values, particularly where and how people want to live. Each must take into account the traditions, customs, and life styles of the country. No single word accurately describes the condition of the world's population.

  The problems of a large country growing rapidly differ from those of a large country growing slowly. Similarly, the concerns of a small country growing rapidly differ from those of a small country growing slowly. While some countries are trying to increase the size of their populations, others are trying to slow their rate of growth.

- *The ship hits a time warp, and Ocarina finds herself on a fantasized Earth in the year 2727.*

  In the world today (1970's), there are essentially two types of countries: the developed and the developing.

  The developing countries are generally characterized by poverty, a high birth rate, and a low death rate. Most of their efforts must be spent on providing adequate nutrition, jobs, housing, and education for their rapidly growing populations. Consequently, they have neither the time nor the money to develop technology and natural resources which could raise their standard of living. Additionally, as much as 45% of the population is under 15 years of age. Thus, even if the birth rate dropped sharply, the momentum of past growth would keep the population growing for many years in the future.

  Death control is the principal reason for the rapid rates of population growth in the developing countries.

  The developed countries are generally characterized by industrialization, a high standard of living, a low birth rate, and a correspondingly low death rate. But the desire for the "good life" in these countries is resulting in high patterns of consumption, depletion of resources, and high concentrations of population in small areas. In some cases, the absence of adequate technology is adding to problems of environmental deterioration, pollution, and unlivable cities. Growth rates, while not as rapid as those of the developing countries, still pose a concern in achieving a proper balance in size, growth, distribution, and the quality of life sought.

- *Again aboard the space ship, Ocarina speculates about the future.*

  No choice is a choice; no action is an action. Because of the momentum of population change, decisions made today will have consequences far in the future.

  Although the future is unpredictable for the most part, some components are foreseeable. For instance, if American women reproduce at replacement level and immigration remains at roughly today's levels (about 400,000 a year), the population of the United States will be nearly 350,000,000 by the year 2070. The potential exists for an even larger population: nearly one billion by 2070 if women choose to bear an average of three children. Presently, over 210 million people live in America, and our actions today determine the options available to us tomorrow. While we presently have a great many choices available, those choices may be limited in the future unless we make changes today. If we want positive change, strategic planning must be started now, for the processes required to facilitate change are long term and may not be felt for many years.

Additionally, countries can no longer assume that the consequences of their actions do not affect the rest of the world. The earth is finite, limited in size, space and resources; and while individual decisions may seem unimportant, the multiplicity of these decisions have the greatest impact.

We still have time to plan, to consider our patterns of consumption, the use of technology, the distribution of people, and the size and rate of our population growth. But we must begin now. The absence of a series of coordinated population policies represents a choice: the choice to do nothing about the problems of today and the even greater resultant problems of tomorrow.

Indeed, the future *is* now.

SUGGESTED ACTIVITIES:

Before the Program

1. If desired, have students complete the vocabulary exercise.
2. Students should review the following:
   a) Vital rates: birth rate, death rate, growth rate
   b) Death control
   c) Momentum
   d) Doubling time
   e) The 0-, 1-, 2-, and 3-child family
3. Inform students that a portion of the program they are about to see takes place in a fantasized earth-future in the year 2727. The world portrayed is rather desolate and forboding. Based on what we know about prediction and projection, is the world depicted realistic? Why do you think the television writer chose the year 2727?

   Hint: Because we cannot make any reasonable assumptions about life in the year 2727, one person's speculation about this remote future is just as good as another's.

   If you were writing the script, would you have chosen an era closer to our own time? Why or why not? While viewing the program, determine the assumptions used by the writer in his portrayal of the future. Was he projecting, predicting, or neither?

After the Program

1. Readminister the Population Values Inventory and the Population Knowledge Inventory to measure change in student values and knowledge. Compare and discuss with the earlier one.
2. Have students write a creative story about life in the future. Compare this with their earlier story. What characteristics are they aware of now?
3. Brainstorm: Cities under the sea; domed cities; solar energy; new sources of food; alternative life styles. Are these possible? Will we be forced to change? Will technology keep pace?
4. Discuss: What present events may indicate changes in the future?

   Some hints:
   Food shortages
   Rising prices
   Energy crisis
5. Using the chart on page 64, discuss birth and death rates in developed and developing countries. Questions printed on the graph will help you with this activity.
6. Using the charts on page 55 and 63, discuss how you think population growth and distribution will affect life in the future.

PROGRAM 12

VOCABULARY EXERCISE

Unscramble the population-related words listed below and match them with their correct definition.

TUPMOMI	RYCINGAR APACTYIC
GEVLEDPOIN UNTORCY	DEPEEVOLD CYROTNU
LUCNOTIASPE	CRIPEDIONT
ORPNOIEJTC	

A. The scientific carrying forward of trends from the past and/or present, making assumptions about their continuation.

B. A country which has not gone through industrialization (generally characterized by poverty, a high birth rate, and a low death rate).

C. The best or most favorable under specific conditions.

D. Conjectural consideration of a matter.

E. The maximum number of people the earth, a country, locality, etc., can provide for.

F. A country which has undergone industrialization (generally characterized by a high standard of living, a low birth rate, and a low death rate).

G. A declaration of what will happen in the future.

KEY	
OPTIMUM (C)	CARRYING CAPACITY (E)
DEVELOPING COUNTRY (B)	DEVELOPED COUNTRY (F)
SPECULATION (D)	PREDICTION (G)
PROJECTION (A)	

GLOSSARY

ANTINATALIST: Against childbearing.

ARITHMETIC (Progression): A sequence in which each term after the first is formed by adding a constant to each preceding term: e.g. 1,2,3,4,5, etc., or 3,5,7,9,11, etc.

ASSUMPTION: A statement taken as granted or true without proof for demonstration; supposition.

ATTITUDE: Manner, disposition, feeling, position, etc., with regard to a person or thing.

BIODEGRADABLE: Capable of decaying and being absorbed by the environment.

BIRTH CONTROL: The practice of limiting or spacing the number of births.

BIRTH RATE: The number of live births in one year per 1,000 mid-year population.

CARRYING CAPACITY: The maximum number of people the earth, a country, locality, etc., can provide for.

CITY: A large or important town.

COERCION: To compel by force, intimidation, or authority without regard for individual desire or volition.

COMMONS: Land and/or resources belonging equally to or shared alike by two or more or all in question.

COMPROMISE: To adjust or settle by mutual concession.

CONSUMPTION: The use of goods, resources, and services.

CONTRACEPTIVES: Artificial or chemical devices used to control conception.

CROWD: Any group of people gathered together.

CROWDING: An individual feeling and a matter of perception that there are too many people at a given time and place.

DEATH CONTROL: The practice of controlling deaths in a population.

DEATH RATE: The number of deaths in one year per 1,000 mid-year population.

DEMOGRAPHER: A scientist who studies human populations.

DEMOGRAPHY: Statistical analysis and description of human population groups in terms of distribution, vital rates, age, and sex.

DENSITY: The number of people in a given area at a given time.

DEVELOPED COUNTRY: A country which has undergone industrialization. (Generally characterized by a high standard of living, a low birth rate, and a low death rate.)

DEVELOPING COUNTRY: A country which has not gone through industrialization. (Generally characterized by poverty, a high birth rate and a low death rate.)

DISTRIBUTION: The way a population is spread over a given area.

DOUBLING TIME: The time it takes for a population to double in size.

EMIGRANT: A person who emigrates.

EMIGRATE: To move out of a country, permanently.

EMIGRATION: The act of people moving out of a country, permanently.

ENVIRONMENT: Something that surrounds. (Generally used to apply to the natural environment, including air, land, water, etc., and/or to the social environment, the nature of the society surrounding the individual.)

ENVIRONMENTAL DETERIORATION: A worsening of the quality and/or conditions of an environment.

EXURB: A small community beyond the suburbs of a city, but with related importance to a city.

FINITE: Having limitations or boundaries.

FERTILITY (as defined herein): The number of children born to women.

GENERAL FERTILITY RATE: The number of live births in one year per 1,000 females of childbearing age (usually defined as ages 15-49).

GENOCIDE: The deliberate and systematic extermination of a national or racial group.

GEOMETRIC (Progression): A sequence of terms, each of which is a constant multiple of the immediately preceding term: e.g. 2, 4, 8, 16, etc., or 3,9,27,81, etc.

GROWTH RATE: The degree to which a population grows or declines annually, expressed as a percent.

IMMIGRANT: A person who immigrates.

IMMIGRATE: To move into a country, permanently.

IMMIGRATION: The act of people moving into a country, permanently.

INFANT MORTALITY RATE: The ratio of infant deaths in a given year to live births in the same year. "Infant" refers to children under one year of age.

INFINITE: Having no limits or boundaries.

LIFE EXPECTANCY: Under given mortality conditions (that is, age-specific death rates), the average number of years of life remaining to people of a specified age.

MAXIMIZE: To increase to the greatest quantity or value attainable.

MEGALOPOLIS: An urban region consisting of several large cities and suburbs that adjoin each other.

METROPOLITAN: Of or pertaining to a metropolitan area.

METROPOLITAN AREA: An urban area consisting of a central city, several suburbs, and exurbs that adjoin each other.

MIGRANT: A person who migrates.

MIGRATE: To move to another area with the intention of establishing permanent residence.

MIGRATION: The act of people migrating.

MOMENTUM: A property of a moving body that determines the length of time required to bring it to rest when under the action of a constant force or movement.

MORTALITY: Pertaining to deaths.

NATAL: Pertaining to births.

NATURAL INCREASE OR DECREASE: The difference between births and deaths in a given population in a given period of time.

OPTIMUM: The best or most favorable under specific conditions.

OVERPOPULATION: A word that assumes we know an optimum level of population and the earth's carrying capacity; a definition of 'overpopulation' depends on one's values. (However, assuming an optimum level and the earth's carrying capacity were known, we could define overpopulation as an excess over the optimum level and carrying capacity.)

PERCEPTION: One's understanding or view of a given situation.

POLICY: A definite course of action adopted and pursued to a given end by a government, ruler, country, etc.

POLLUTION: Made physically unclean or impure.

POPULATION: The body of inhabitants (e.g. people, rocks, plants, animals, etc.) in a given area at a given time.

PREDICTION: A declaration of what will happen in the future.

PROCREATION: The act of producing offspring.

PROJECTION: The scientific carrying forward of trends from the past and/or present, making assumptions about their continuation.

PRONATALIST: In favor of childbearing.

REPLACEMENT: A fertility level where women have only an average of about two children. It is consistent with zero population growth after the unevenness of the age structure works out.

SPECULATION: Conjectural consideration of a matter; conjecture or surmise.

STABLE POPULATION: A population whose rate of growth or decline is constant, and in which the birth rate, death rate, and age-sex structure are also constant.

SUBSISTENCE: The minimum necessary to support life.

SUBURB: A district lying immediately outside a city or town.

TECHNOLOGY: The sum of the ways in which a social group provides themselves with the material objects of their civilization. Also, the application of science, especially to industrial and commercial objectives.

URBAN: Of or pertaining to or comprising a city or town.

URBANIZATION: The quality or state of being or becoming urbanized.

VALUE: Relative worth, utility, or importance.

VOLUNTARY: Done, made, brought about, etc., of one's own accord or by free choice.

ZERO POPULATION GROWTH: The number of births per year equals the number of deaths per year.

ZPG: Abbreviation for zero population growth. Also, the initials of a political organization devoted to stopping U.S. and world population growth by voluntary means.

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SUGGESTED READINGS FOR TEACHERS

"Teaching about Population," *Intercom #72: Notes on Population Education*. Center for War/Peace Studies, 218 E. 18th St., New York 10003, 1973 (50c). (Prepared and published in cooperation with The Population Council, New York).

Resource guide containing lesson plans, lists of teaching materials on population, films, books, and games, and a description of organization activities.

Horsley, Kathryn (ed.), *Interchange*, Population Reference Bureau, Inc., 1775 Massachusetts Ave., N.W., Washington, D.C. 20036 ($2.00 per year).

Bi-monthly population education newsletter for junior and senior high levels providing explanations of demographic trends, information on training opportunities, and instructional activities.

Petersen, William, *Population*, New York: The McMillan Co., 1969, (2nd edition).

Demography text explaining demographic processes and historic population growth and policies.

Viederman, Stephen (ed.), *Social Education*, Vol. 36, No. 4, April 1972.

Special issue on population education including definitions, history, theories of utilization, and an extensive list of resource materials.

SUGGESTED READINGS FOR STUDENTS

Lowenherz, Robert J., *Population*, Mankato, Minnesota, Creative Education Press, 1970. (Order from: Columbia Books, Inc., 917 15th Street, N.W., Washington, D.C. 20005.)

Easy to read, graphic statement of the characteristics and problems of population growth.

Frankel, Lillian, B., *This Crowded World*, Population Reference Bureau, Inc., Washington, D.C.: Columbia Books, Inc., 1970 ($1.50).

Elementary level reader emphasizing the historic growth of human population, census taking, "population arithmetic," and environmental problems.

Cook, Robert C. and Jane Lecht, *People!* Population Reference Bureau, Inc., Washington, D.C.: Columbia Books, Inc., 1968 ($1.50).

Junior high reader concerning census taking, historic population increase in the United States and the world, and problems of food production.

The World Population Dilemma, Population Reference Bureau, Inc., Washington, D.C.: Columbia Books, Inc., 1972 ($1.50).

High school reader covering historic population growth, momentum, U.S. minority patterns, and future models of population change.

Lee, Everett and Bouvier, Leon, *Population Profiles*, Washington, Connecticut: Center for Information on America, 1971-74.

Number	Title
No. 1	"Why Study Population?"
No. 2	"The United States Among the Nations."
No. 3	"The Vital Revolution: How Did We Get Where We Are Now?"
No. 4	"The Health of Americans—Trends in Illness and Mortality."
No. 5	"The Bearing of Children."
No. 6	"Endless Movement: America as a Nation of Migrants."
No. 7	"The Desertion of Our Countryside."
No. 8	"Growth and Future of Cities."
No. 9	"The Nation's Minorities."
No. 10	"Black America."
No. 11	"Our Human Resources."
No. 12	"Education and Human Capacities."
No. 13	"Population of the Future."
No. 14	"Nature and Uses of the United States Census."

Series of short graphic descriptions of demographic phenomena.

Sauer, Rob (ed.), *Voyages: Scenarios for a Ship Called Earth*, New York Intext Publishers, 1970 (paperback 95c).

A collection of science fiction stories focusing on ecological and environmental problems.

Stauler, John (ed.), *Eco-Fiction*, New York: Washington Square Press, 1971 (paperback 95c).

A collection of short stories focusing on man's position in the environmental crisis.

We The Americans, Bureau of the Census. Washington, D.C., U.S. Government Printing Office, 1972-73 (40-45c each).

Titles:

"Who We Are"
"We, the Black Americans"
"Our Homes"
"We, the American Women"
"Nos Otros" *(Spanish groups)*
"Our Cities and Suburbs"
"Our Education"
"The Work We Do"
"We, the American Elderly"
"Young Marrieds"
"We, the First Americans"
"We, the Asian Americans"
"We, the Youth of America"
"We, the American Foreign-Born"

Non-technical graphic series of short reports from the 1970 census.

SUGGESTED READINGS FOR TEACHERS AND STUDENTS

Pohlman, Edward (ed.), *Population: A Clash of Prophets*. New York: New American Library, 1973 (paperback $1.95).

A collection of 85 short, non-technical statements on population for Malthus to Chou En-Lai; excellent for discussion purposes.

Callahan, Daniel (ed.), *The American Population Debate*, New York: Doubleday, 1971. (paperback available).

A collection of general readings on the population "problem" and its possible "solution."

Options: A Study Guide to Population and the American Future, Population Reference Bureau, Inc., Washington, D.C. 1973 (50c handling charge).

A guide for exploring population trends and their possible effects on the future based on the National Commission Report; stimulating activities; large bibliography; an excellent resource.

A Census Portrait Of . . . (each of fifty states), Bureau of the Census, Washington, D.C., Publications Distribution Section, Social and Economic Statistics Administration, Washington, D.C. 20233, 1974 (10c each).

Separate extremely detailed, but easy to read "portraits" on each of the fifty states using results from the 1970 census on subjects of population composition, distribution, age, marital status, income, education, jobs, and housing. Each portrait contains a state map divided into counties, showing areas of population concentration.

World Population Data Sheet (updated annually), Population Reference Bureau, Inc., 1755 Massachusetts Ave., N.W., Washington, D.C. (25c handling charge).

Single page listing eleven population-related variables for 163 nations; an excellent resource.

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Comprehensive, non-technical report assessing the impact of population change on many aspects of American life; excellent resource.

Oppenheimer, Valerie F., *Population*, Headline Series, No. 206, June 1971, Foreign Policy Association, 345 E. 46th Street, New York ($1.00 per copy).

Balanced summary of both past and present world demographic history and basic demographic theory.

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ACKNOWLEDGEMENTS

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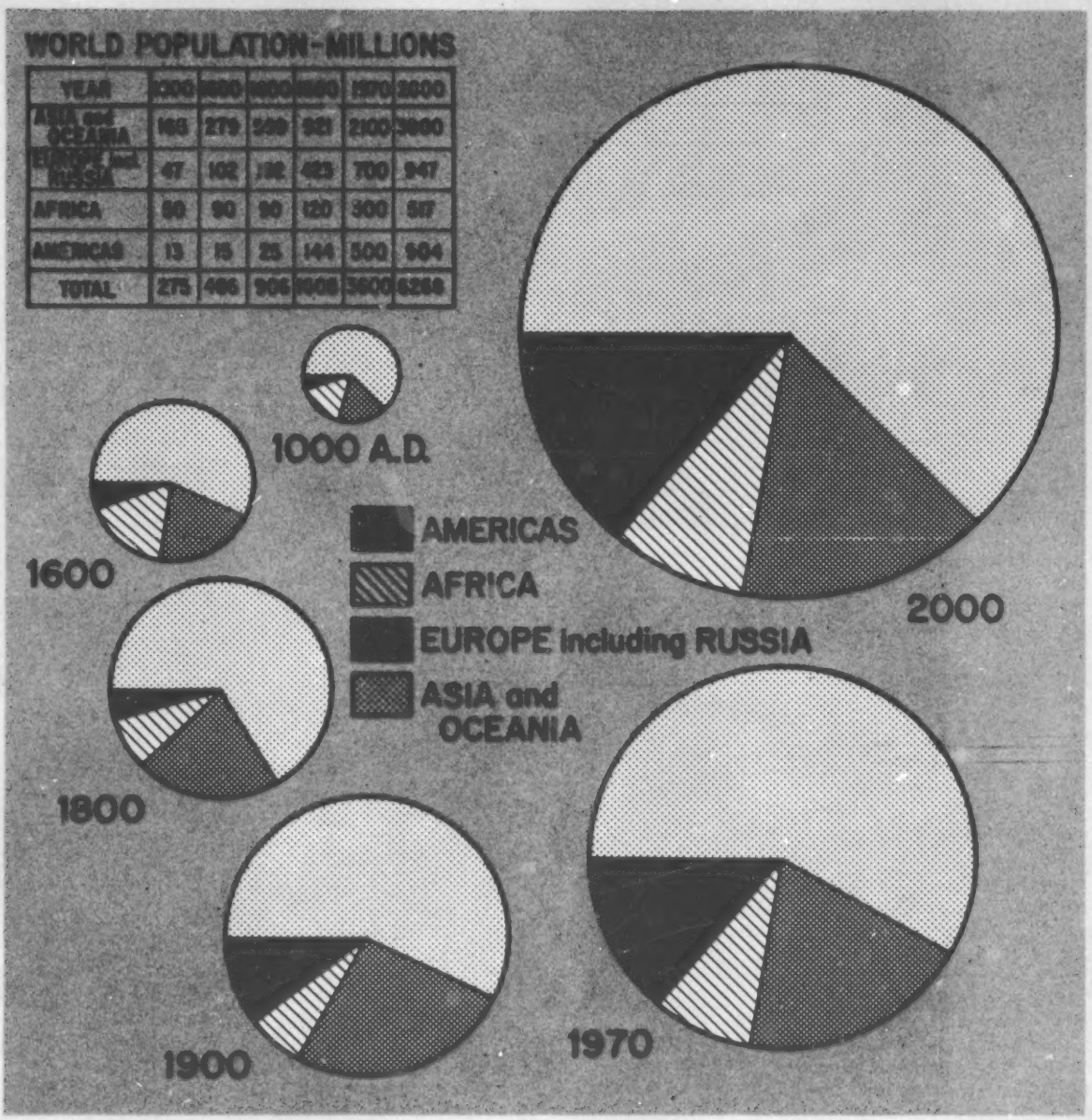
USE WITH PROGRAMS 2, 3, and 12

QUESTIONS:

1. What has happened to world population since 1000 A.D.?
2. Why do you think world population grew so slowly between 1000 A.D. and 1600 A.D.?
3. Use the chart to determine which country had the fastest population growth between 1000 A.D. and 1970 A.D.? What might account for this?
4. Why is the circle for the year 2000 A.D. larger than the others?

ONE THOUSAND YEARS OF POPULATION GROWTH

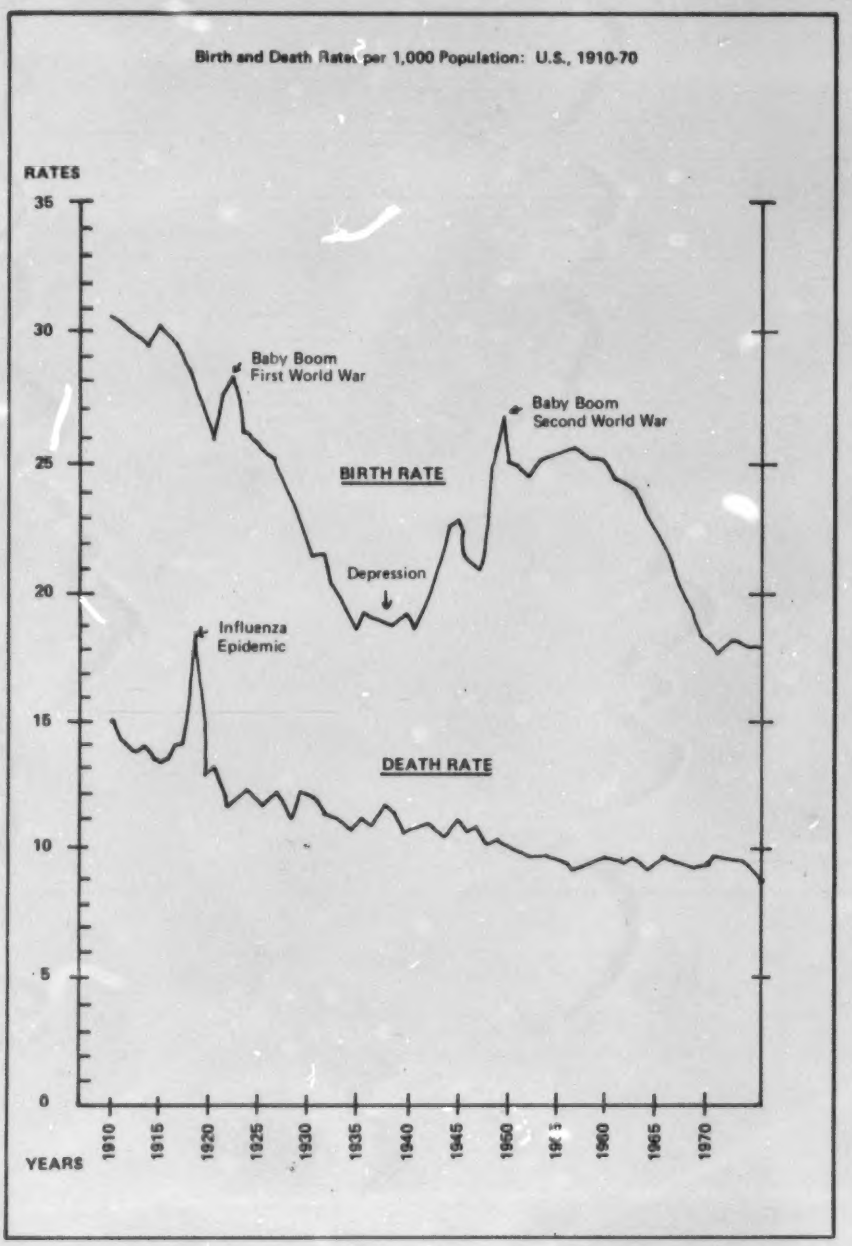


YEAR	1000	1600	1800	1900	1970	2000
ASIA and OCEANIA	165	279	509	961	2100	3900
EUROPE incl. RUSSIA	47	103	180	423	700	947
AFRICA	50	90	90	120	300	517
AMERICAS	13	15	25	144	500	904
TOTAL	275	486	906	1648	3600	6268

USE WITH PROGRAM 3 (TRENDS)

QUESTIONS

1. What has happened to the birth rate since 1910? The death rate? Which has declined faster?
2. How has the decline in the death rate affected U.S. Population? List some reasons.
3. List some reasons contributing to the decline in the death rate.
4. Why are the peaks similar in the birth rates after World Wars I & II? What did this mean for the country?
5. List some reasons why the birth rate started declining in the 1920's.



USE WITH PROGRAMS 3 (TRENDS) and 9 (ZERO GROWTH?)

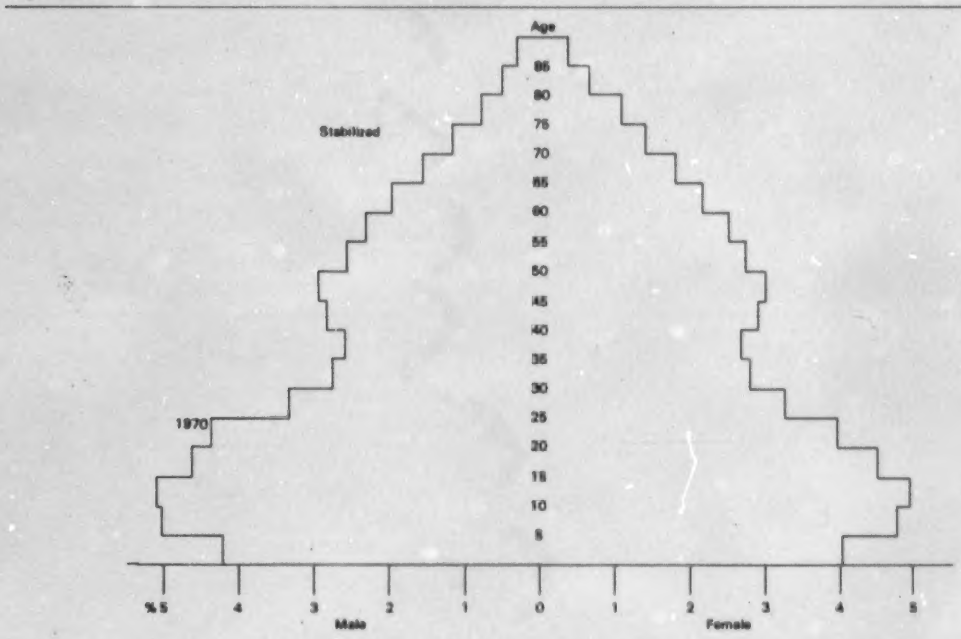
QUESTIONS: PROGRAM 3 (TRENDS)

1. Where are you located on the pyramid? Are there many others the same age as you? Are you in the majority? List some reasons which might account for this.
2. Compare the number of people in your age group with that of those 65 or older. What does this tell you about current needs for services and expenditures?
3. Project yourself 5, 10, and 15 years in the future (move your age group up). What is going to happen? *Hint:* Will most of you go to college? You will be needing a job. Marriage? Children? No children?
4. Look at the people below you on the pyramid. Are there more or less of them? Project their needs in the future.

QUESTIONS: PROGRAM 9 (ZERO GROWTH?)

1. Compare the present age structure with that of a stabilized population (gray overlay). What are the differences?
2. What differences in needs and services do you foresee with a stable population. Why?
3. Look at the present age structure. Why will it take almost 70 years to reach a stable population?
4. List some reasons why you favor or do not favor zero growth.

Figure 7.1 Age Distribution



In a stabilized population with low death rates, equal numbers of births and deaths, and no immigration, the number of 50-year-olds would be nearly as large as the number of 5-year-olds.

Source: Ansley Coale, "Alternative Paths to a Stationary Population" (prepared for the Commission, 1972).

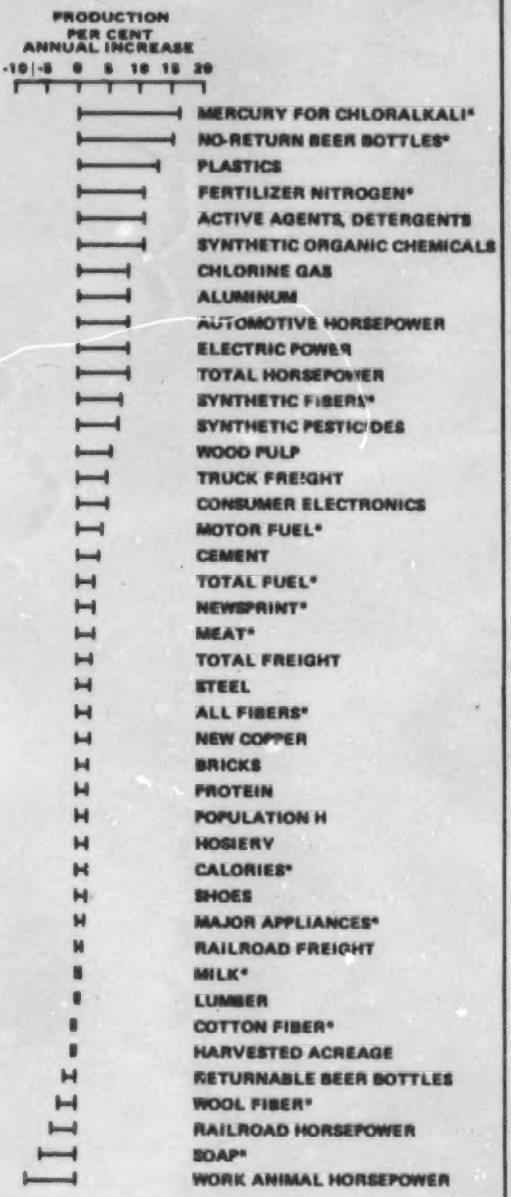
USE WITH PROGRAM 5

(POLLUTION)

QUESTIONS

1. Locate the bar for population. Compare it with the one for no-return beer bottles. Which has increased faster? What does this tell you. Compare population with returnable beer bottles.
2. Compare increases in population with increases in energy production or consumption (there are several). Think of ways you use energy. Speculate about future needs.
3. Compare population with harvested acreage. Is agriculture keeping up? Can you tell from average figures alone?
4. Look at the bars for population and the consumption of motor fuel. What does this tell you about the driving habits of Americans? Also look at the production of automotive horsepower. What do these increases tell you about the relationship between population and pollution?
5. Determine if population is the "root cause" of pollution. How do technology, consumption, and distribution fit in? What is happening to our natural resources, such as chlorine gas, oil, and aluminum?

ANNUAL GROWTH RATES OF PRODUCTION (OR CONSUMPTION) IN THE UNITED STATES



*CONSUMPTION

Source: U.S. Bureau of the Census, *Statistical Abstract of the United States*, 1948-1970.

Population, Resources, and the Environment

USE WITH PROGRAM No. 5

USE WITH PROGRAM 7 (METROPOLITAN AREAS)

QUESTIONS

1. Look at the graph on the right. What does it mean? What will it mean in the future? What if the line continues to rise?
2. Again look at the graph on the right. In what year did urbanization begin in earnest (when it started rising faster). What caused this?
3. Look at the graph on the left. What has happened to the rural population since 1800? What reasons might account for this?
4. Using the graph on the left, project what will happen if this trend continues.

UNITED STATES SUMMARY

NUMBER OF INHABITANTS

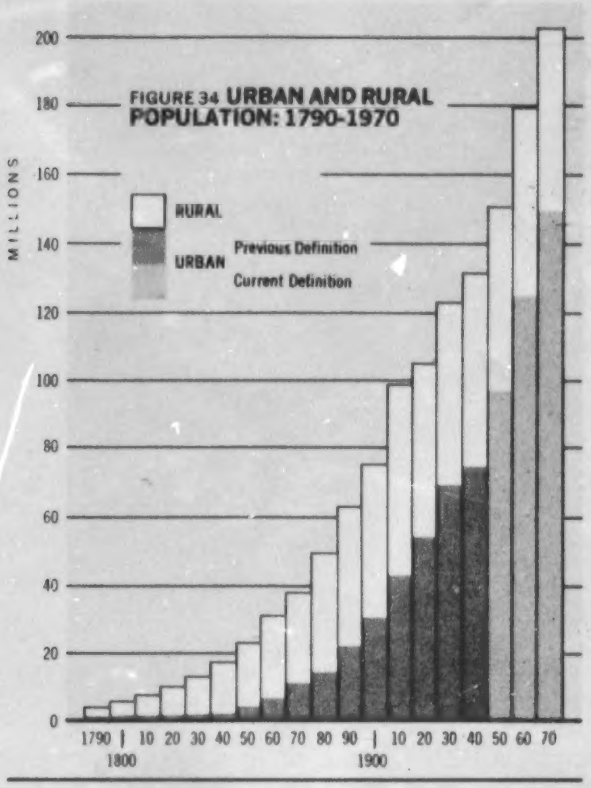


FIGURE 34 URBAN AND RURAL POPULATION: 1790-1970

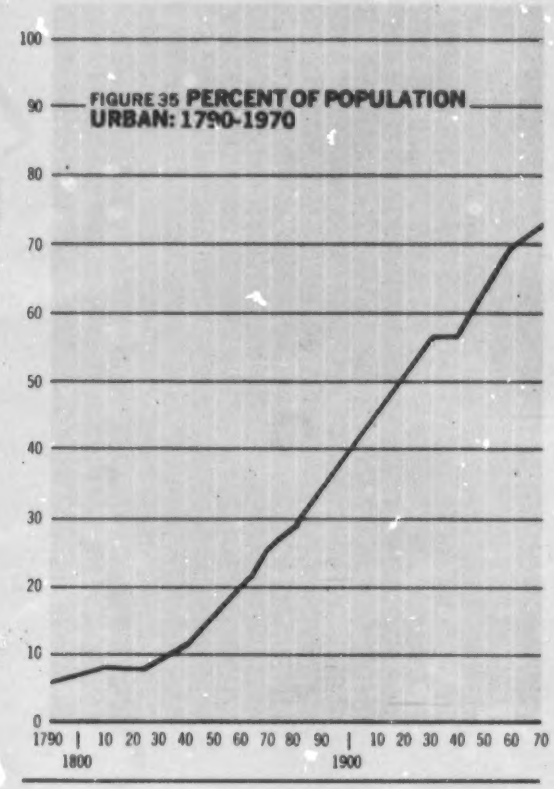
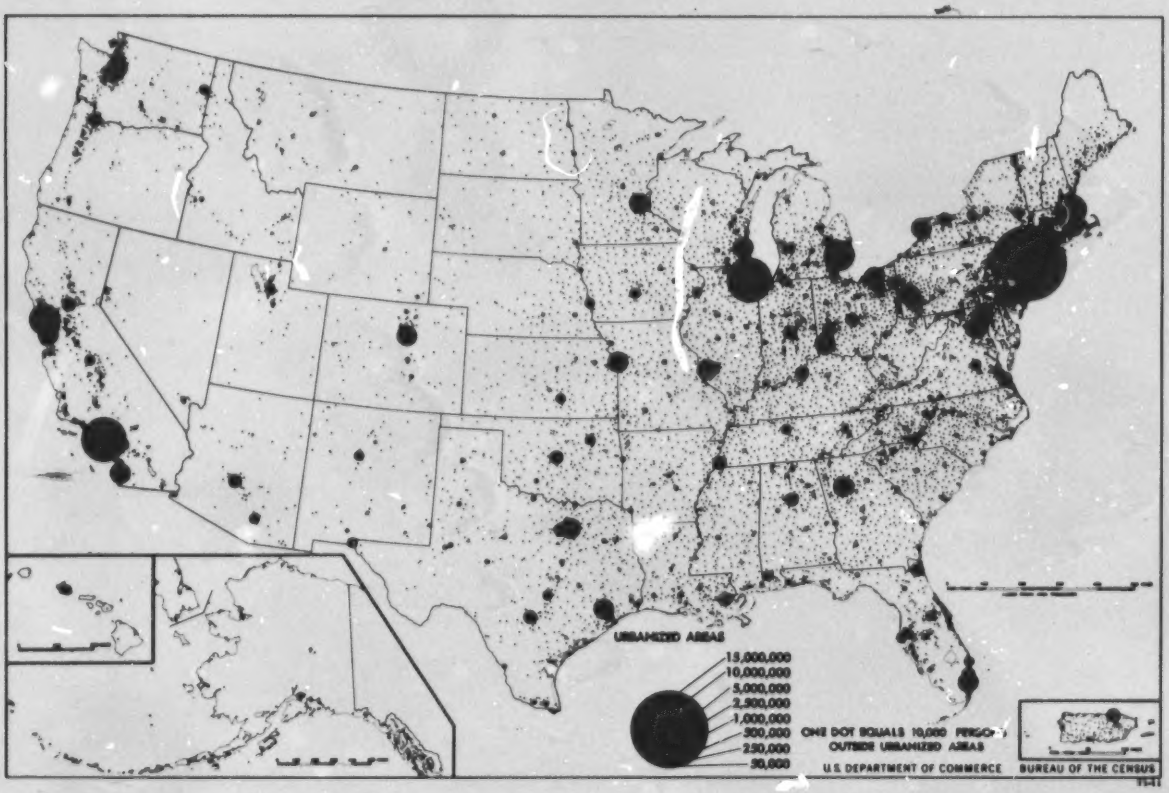


FIGURE 35 PERCENT OF POPULATION URBAN: 1790-1970

USE WITH PROGRAM 7 (METROPOLITAN AREAS)

QUESTIONS:

1. Look at the map. Where do most Americans live? List some possible reasons for this.
2. The U.S. Bureau of the Census says that by the year 2000 most Americans will be living in four major "supercities." Can you find them on the map? *Hint:* One will be between Boston and Washington, D.C.
3. What would the map look like if the population of the United States were distributed evenly? Would this be good or bad? List some reasons for each.
4. Since most Americans live in metropolitan areas, do you think that the reasons for problems in large cities is because there are too many people living there? What other reasons might contribute to these problems?

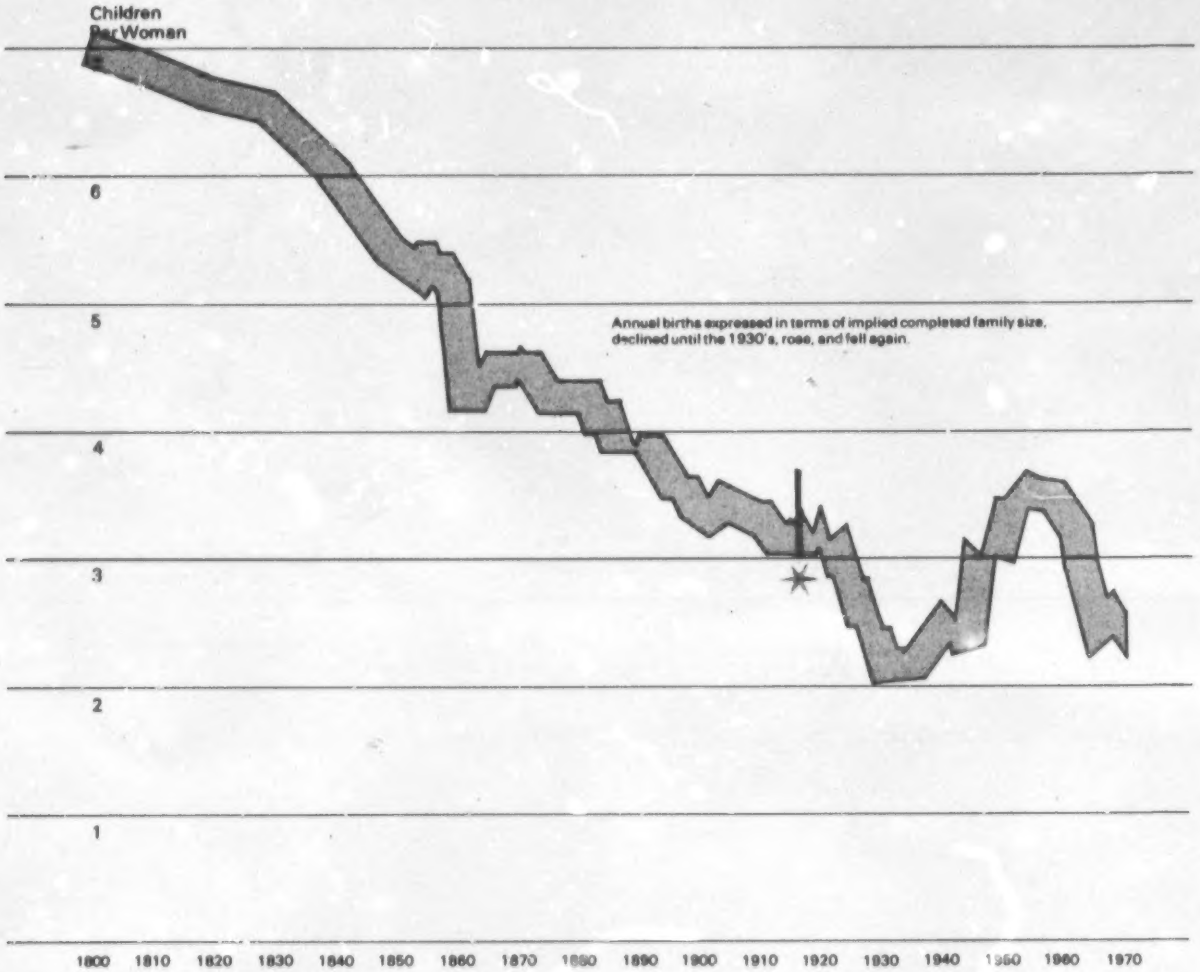


USE V ITH PROGRAM 8 (FAMILIES AND BABIES)

QUESTIONS

1. What has been the fertility trend in America since 1800?
2. List some reasons for such a high fertility rate in the 1800's.
3. What happened in 1929 that caused fertility to decline? Why do you suppose women averaged only two children?
4. Locate the post-World War II baby boom on the graph. What was the level of fertility? List some reasons for this.
5. What has happened to fertility since 1960? Do you think it will continue thus in the future? Why? Why not?

Figure 2.1 Total Fertility Rate



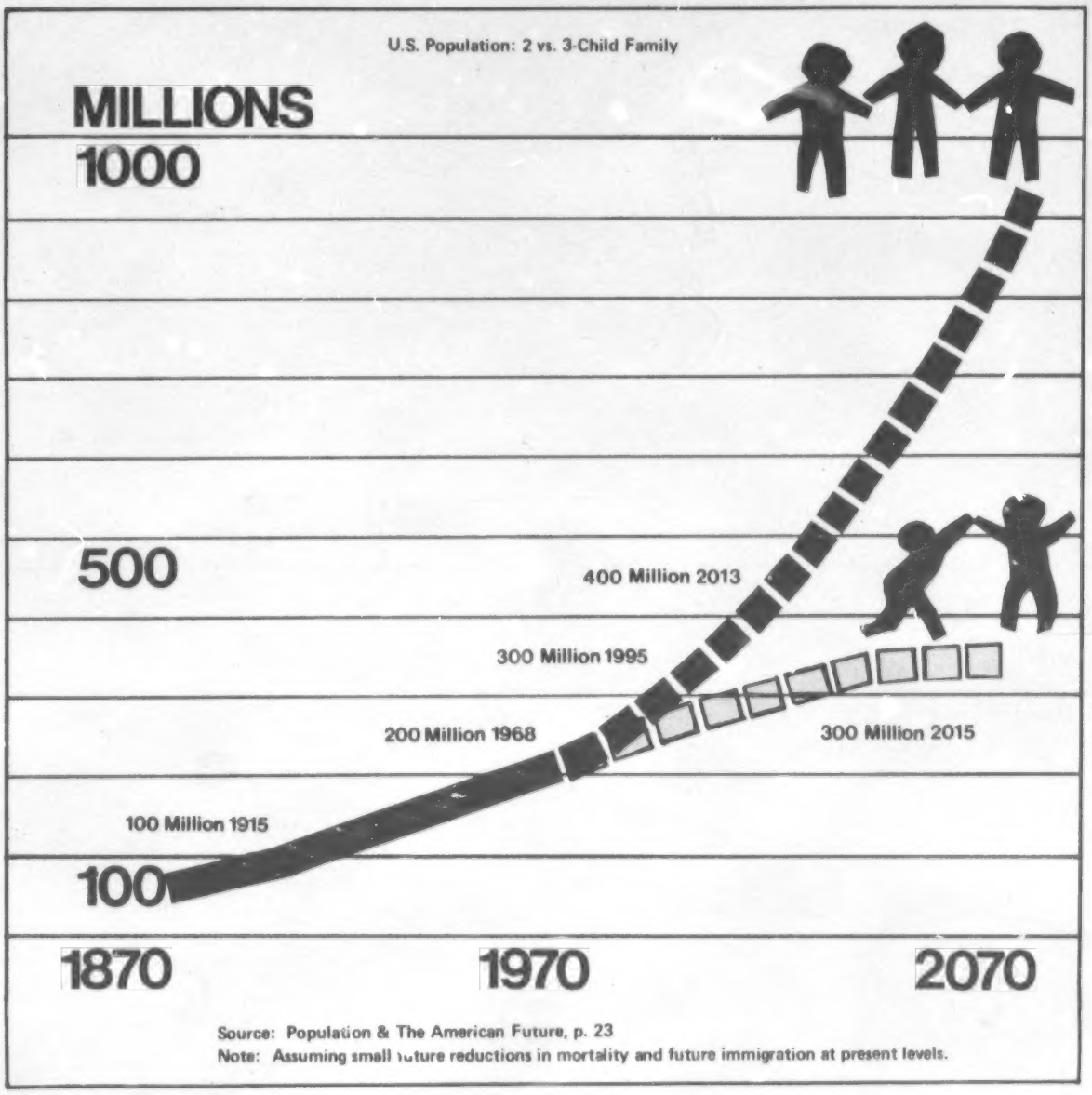
*Prior to 1917, data available only for white population; after 1917, for total population.

Sources: Prior to 1917—Ansley Coale and Melvin Zelnik, New Estimates of Fertility and Population in the United States (Princeton: Princeton University Press, 1963). 1917 to 1968—U.S. National Center for Health Statistics, Natality Statistics Analysis, Series 21, Number 19, 1970. 1969 to 1971—U.S. Bureau of the Census, Current Population Reports, Series P-23, No. 36, "Fertility Indicators: 1970," 1971. The figure for 1971 is based on an unpublished Census staff estimate.

USE WITH PROGRAM 9 (ZERO GROWTH?)

QUESTIONS

1. Look at the graph. What was the population of the United States in 1900? In 1970? What will it be in the year 2000 under the two-child-average per family? The three-child-average per family?
2. What will be the population of the United States in the year 2070 under the two-child-average per family? Under the three-child-average per family?
3. Why does only one child per family make such a difference in the population size?
4. Add a line to the graph showing what the population would look like in the year 2070 under a one-child-average per family.



Source: Population & The American Future, p. 23
Note: Assuming small future reductions in mortality and future immigration at present levels.

USE WITH PROGRAMS 7 AND 12 (ALTERNATIVE FUTURES)

QUESTIONS

1. Compare this map with the one showing population distribution in America today (p. 65). Do you think the Bureau of Census projection is accurate? What are some of the assumptions the Census Bureau used for their projection?
2. Locate the four major "supercities" we talked about in Program 7. Close your eyes and try to imagine what these areas will look like while flying over them in an airplane. What do you see?
3. If the projection on this map is accurate, do you think people will be living differently in the future? In what ways?

1. Metropolitan Belt
   1.a. Atlantic Seabord
   1.b. Lower Great Lakes
2. California Region
3. Florida Peninsula
4. Gulf Coast
5. East Central Texas—Red River
6. Southern Piedmont
7. North Georgia—South East Tennessee
8. Puget Sound
9. Twin Cities Region
10. Colorado Piedmont
11. Saint Louis
12. Metropolitan Arizona
13. Willamette Valley
14. Central Oklahoma—Arkansas Valley
15. Missouri—Kaw Valley
16. North Alabama
17. Blue Grass
18. Southern Coastal Plain
19. Salt Lake Valley
20. Central Illinois
21. Nashville Region
22. East Tennessee
23. Oahu Island
24. Memphis
25. El Paso—Ciudad Juarez

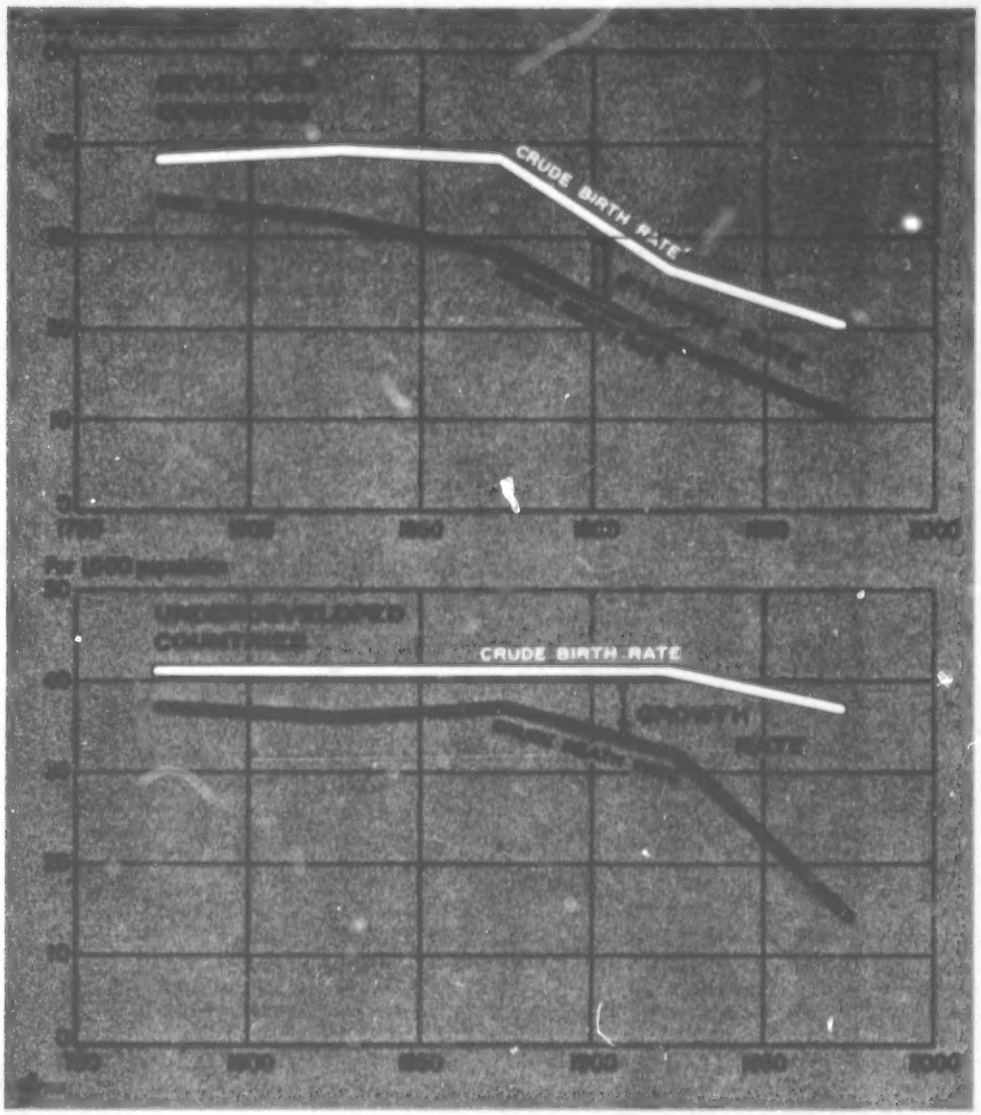
Based on 2-child family projection

Source: Jerome P. Pickard, "U.S. Metropolitan Growth and Expansion, 1970-2000, with Population Projections" (prepared for the Commission, 1972).

QUESTIONS

1. Compare the birth rates and death rates in the two types of countries. What are the similarities and differences?
2. Why is population increasing so rapidly in the developing countries?
3. Why do you think birth rates stayed so high in developing countries? Perhaps you might go to the library and research customs, traditions, and attitudes in these countries.
4. What happened in the late 1800's that caused the death rate to decline in each of the two types of countries? Can you think of other reasons?
5. Research and compare life styles for developed and developing countries. What are the differences? List some reasons why the birth and death rates influence this.

ESTIMATED BIRTH AND DEATH RATES, 1770-1970



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